

The Iron Age

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Die-Grinding Machine for a Bliss Press.

We take pleasure in presenting on this page engravings of a new machine recently built by the Tanite Company, of Stroudsburg, Pa. The machine was designed for grinding dies for one of the presses built by the E. W. Bliss Company, of Brooklyn, N. Y., to be used in cutting thin sheet-iron disks, and its arrangement embodies a number of interesting features.

Fig. 1 represents a general view showing a die in position to be ground. A lengthy description is practically unnecessary, as there is nothing complicated about the machine, and the illustrations show very clearly the more important details. Referring to the diagram (Fig. 2), however, it is proper to point out that the punch or die A, for the grinding of which the machine was built, has four $\frac{1}{2}$ inch projections, so as to give a shear cut. To allow for this in grinding the arrangement shown in Fig. 2 has been adopted. The miter-wheel D is driven by the arbor of the three-cone pulley, shown in Fig. 1, and the sizes of the different wheels are such that one revolution of the wheel B gives four revolutions to the wheel C. This wheel acts through an adjustable crank, E, giving to the screw F a slow reciprocating motion. The screw directly controls the motion of the emery-wheel G, and, owing to the to-and-fro motion which it gives the carriage moving on the ways H H, it causes to be ground on the cutting edge of the punch four long regular waves, the projecting points for a punch about $10\frac{1}{2}$ inches in diameter measuring about $\frac{1}{4}$ inch from the bottom of each depression. The depth of depression, of course, varies for different sizes of punches, and the adjustability of the crank E, which is readily understood from the cut, permits any desired variation.

The emery-wheel G is mounted on a compound rest, so that it can be set at any angle and fed in any direction. The die (as shown in Fig. 1) is plane and does not have the points and depressions. When the die is put on the face plate to be ground the connecting-rod J is detached and the emery-wheel is fed by hand use of the screw F to its proper place. It will then produce a plane cutting edge. The face-plate and feed are such that dies of any diameter from 2 $\frac{1}{2}$ inches to 20 inches can be ground.

A Georgia Coke Furnace.

I was about to state that the only iron furnace using coke for fuel in the State of Georgia was that of the Cherokee Iron Company, at Cedartown, but I forgot that the far-off county of Dade has not only another, but one of the best in any region. However, the furnace of the Cherokee Iron Company was the first in the Southern States to be changed from charcoal to coke. In fact, it was the only one to be so changed without an almost entire rebuilding. Biff Furnace formerly ran on charcoal, but it has been nearly rebuilt to go into blast on coke. There are many others thinking of the change, but where to get the coke has been the problem, and from the fact that the owners of the Cherokee Furnace boldly entered the Coosa coalfield with a railroad, and still more boldly made the coke and used it in their stack, the experiment there being tried and the operations of this furnace are looked to with much interest.

Capt. A. G. West, formerly of Hartford, Conn., was one of the first Northern men who came South after the war to reconstruct the ruined furnaces and rebuild them in the newer ideas. For many years Captain West was the superintendent of the blacksmiths' shops of Colt's Armory, and first invented and used the system of drop forging. Later he was a contractor under the United States Government. After the war he determined to engage in the manufacture of iron in the South, and became one of a party of capitalists who purchased the Shelby Furnace property. Captain West, desiring a change of climate, became superintendent, and after several years of experience there sold his interest in that property and returned to the North. Later he came South and selected Cedartown as the most eligible site for a modern sized charcoal furnace. The place was selected because in the vicinity are large bodies of rich limonites, and then there were unbroken forests of yellow pine many square miles in extent. The site selected, Captain West first erected a flour and grist mill of the most approved style, run by water-power, the dam on the stream being of hewn stone, and was looked upon by the country people as a model of folly and extravagance. It is true that the means of Captain West and his partners were large, but he calculated well. A first-class brick store and ample tenement-houses of the best style and material were erected, then the furnace was built, and in unison with everything else no expense was spared to make it perfect and permanent in character. It was put in blast in 1874, and run with great success on charcoal until 1884. In it was made the very best character of pig iron, which is proved by the fact that in 1885 it sold at the furnace at \$18 per ton.

In June, 1885, the furnace commenced to run on coke as a fuel, the coke used being made out of coal from the Ragland seam in the Coosa coalfield. But little change had

been made in the shape of the furnace when run on charcoal, and as the coke did not work well it was determined to remodel the inside. This was done early in 1886, under the direction of Major E. Dowd, who built the Sewanee Furnace, at Cowan, Tenn., which under his management made more money than any other furnace in the South has ever done in the same length of time.

The ores used in this furnace are all limonites, and are rich in metallic iron and was first used at Cowan Furnace, and was made originally from drawings furnished Mr. Witherow by Major Dowd. Two batteries of double cylinder flue boilers are held in reserve in case of accident to the other, as is also the blast engine formerly used in the charcoal furnace.

The ores used in this furnace are all limonites, and are rich in metallic iron and

furnace and its stack outside of fuel. The quality of the latter was the question. After remodeling, the blast was commenced on coke from the Ragland seam. Every care was taken at the furnace for months, and the results were no better; not a ton of iron better than poor No. 2 mill could be made, and by far the largest part was mottled and white. To determine whether it was in the coke

the iron rapidly changed to mottled and white. It is plain that the fault was in the coke, and whether that fault is in the coal itself, and impossible to eradicate, or in the careless washing, will be discussed in a future paper on the "Prospects of a Coking Coal in the Coosa Coalfield." At the present it is sufficient to say that there are two seams now known in the Coosa coalfield, called the "Ragland seam" and the "Broken Arrow." The latter, a good 4-foot seam, is for some reason but little mined, and some of that little has been coked and tried in the Cherokee Furnace by itself alone. The result was that even in only a two days' run the iron changed to a good No. 2 foundry, thus plainly showing that even with the same coking as the other the Broken Arrow would make a good furnace fuel. At the same time the Ragland has been proven to be a good steam coal.

In the Cherokee Iron Company are Messrs. A. G. West, W. C. Browning, C. F. Browning and John Hull Browning. The same gentlemen own the East and West Railroad of Alabama, and operate the Coosa Coal Company. The railroad was originally built from Cartersville to Rockmart, Geo., part wide and part narrow gauge. When Captain West first put the furnace in blast he hauled all his supplies from and iron to Prior's Station, on the now Alabama Division of the East Tennessee, Virginia and Georgia Railroad. He soon saw the necessity of better communication, and bought the above railroad, changed the whole to narrow gauge and extended it first to Cross Plains, Ala., and then on to Broken Arrow, in the Coosa Coalfield, and in a short time it will be extended to Birmingham. Major T. J. Nichols, formerly of the Chicago and Northwestern Railroad, is the general manager of the railroad, and takes great interest in the development of the resources of this region. The road when changed to standard gauge and extended to Birmingham will be one of the most valuable in the South.

The president of the Iron Company is Capt. A. G. West; of the railroad, W. C. Browning, of New York City; of the Coal Company, E. F. Browning, also of New York, while John Hull Browning is treasurer of all the companies. While there is now an apparent cloud hanging over the use of coke in this furnace, it is certain that Captain West will probe the trouble to the bottom, and will find where the cause exists. In this he could have no more valuable assistant than Major Ed. Dowd, and those interested personally, as well as those desirous of facts from a scientific standpoint, may be certain that those facts will be fully developed in the future. As for the views of your correspondent, and the conclusions he has and shall arrive at, as stated, they will appear in a future number of *The Iron Age*. H. E. C.

Melting Steel with Natural Gas.

At the Wayne Iron and Steel Works, in Pittsburgh, may be seen the latest improvement in the way of a crucible furnace for steel melting with natural gas. The furnace in question is about 27 feet long by about 12 feet 6 inches wide, and is a reversible draft structure with regenerative chambers at each side. It is divided in its main chamber into six divisions or chambers, each of a size to properly admit six crucibles of No. 70 size, making 36 pots in heating at once, and each six-pot chamber being covered by a three-part fire-brick cover, which allows the lifting of a single pot without the uncovering of the others in the same small chamber. There is nothing of this furnace below the ground line but its foundation walls, the regenerative chambers being at the sides, the full length of the furnace, but not quite so high. A platform for the workmen is level with the furnace top. There are six ports to each chamber, three at each side, through which the heated air and natural gas are admitted, the latter through a $\frac{1}{2}$ -inch nozzle at each port. The gas company's gauge shows a pressure of 2 ounces sufficient for the proper operation of the furnace. Economy does not compel the working of the entire six chambers; part of the whole number can be worked and the balance remain idle. Air is admitted at one end of the furnace for both regenerative chambers, and two very plain round valves, to be raised and lowered alternately and operating in connection with two dampers, regulate the air admitted and its reversal.

It is just here that mention should be made of the crucible used at these works. Usually crucibles are deemed to have given a proper duration when five or six heats have been made in each. The practice at the Wayne Works is to use a mixture of plumbago (old crucibles), silicon (white sand is the form employed), and kaolin water. This is made into a semi-fluid wash, and sufficient is poured inside of a crucible, which, when the latter is given a quick turn by an expert boy, flows around the inside and makes a layer just replacing the worn-away part. This is only done when the crucible shows a certain degree of worn inner surface, and the practice is to consider that each must yield a service of eight heats. Patents on the furnace, as well as on the crucible wash, were granted to Mr. John Pedder, the superintendent of the works.

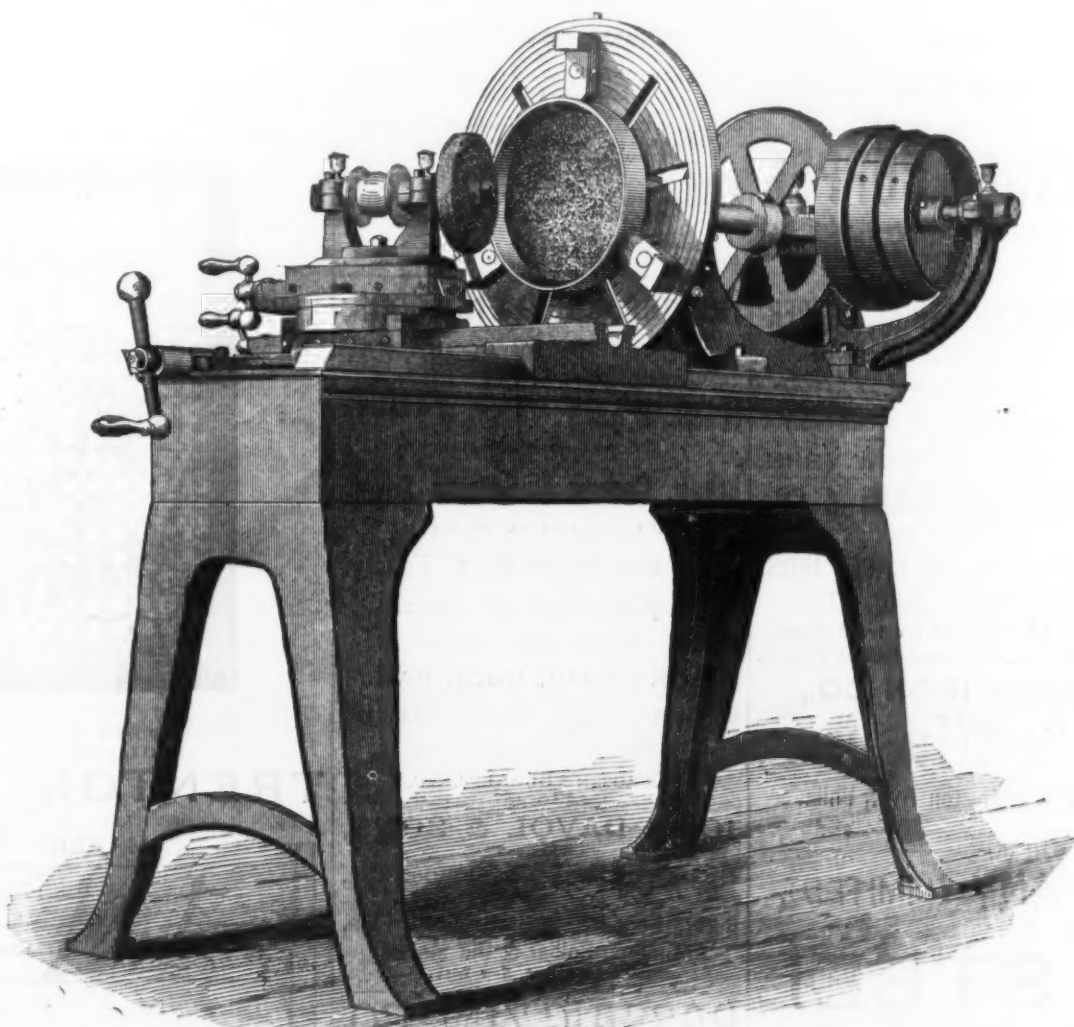


Fig. 1.—General View.

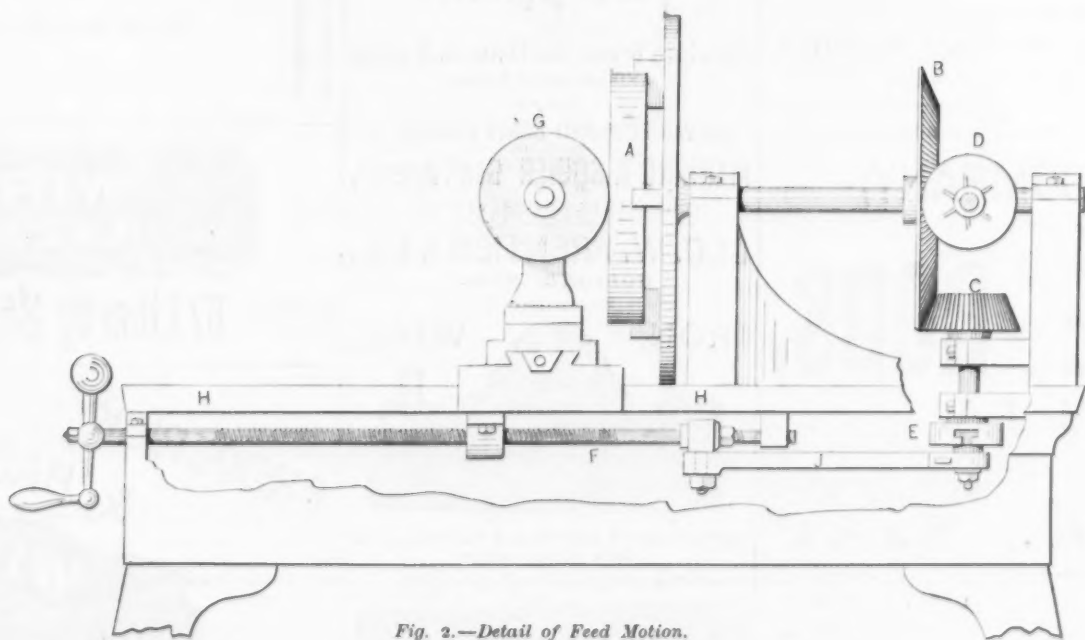


Fig. 2.—Detail of Feed Motion.

DIE-GRINDING MACHINE FOR A BLISS PRESS, BUILT BY THE TANITE COMPANY, STROUDSBURG, PA.

As a furnace constructor, all admit that Major Dowd has no superior. Citico, built by him, is a model in arrangement and compactness, and Captain West says he is the only man in whose charge he is willing to leave the furnace and feel sure that all will go on right. Major Dowd remodeled the stack to its present shape, 13 feet bosh and 60 feet high, with a capacity of 5000 cubic feet. It was newly equipped with a Weimer engine, the blowing cylinders 43 x 84 inches, steam cylinders 36 x 43; the steam is supplied by a Babcock & Wilcox boiler of 480 horse-power, in two batteries. The air is heated in two common iron pipe stoves, which have in all 96 pipes. The air from these goes into the furnace when it is working full capacity at 750° at the tuyeres, and it has been found that it takes 7 tons of air by displacement to make a ton of iron. Were there no leakage of course it would be less. The gas is let in under the boilers through J. P. Witherow's patent apparatus, which equalizes the air. This apparatus

remarkably pure. They often yield 57 per cent. of metallic iron in the furnace. They are all used raw; for the old charcoal furnace all the ore was roasted. From the First Creek Mines, owned and operated by the company, an average of 100 samples contained:

Metallic iron	58.27
Silica	3.54
Phosphorus	0.156
Sulphur	not a trace

This mine is operated by 40 convicts, who are under the superintendence of Capt. J. B. Kendrick. The company pay 90 cents per day for each convict, the party from whom they are leased feeding, clothing and guarding them. Around the furnace others are worked, and all kept each night in quarters at Cedartown, which were pronounced by the Penitentiary Commission to be the best in the State. The limestone for flux is obtained from the lower silurian near Rockmart, and is of the best quality and purity. Such, then, are the equipments of this

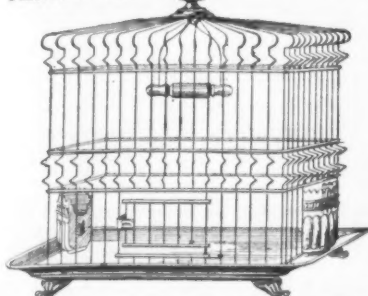
or not, as some parties had said it was the fault of the furnace, Captain West purchased a quantity of Glen Mary coke, which is as near a standard coke as the South produces. The furnace was run direct from the Ragland coke on to Glen Mary; the result was immediately apparent. In a three-days' run on that coke an average of a little over 55 tons of pig per day was produced, which was analyzed by Britton as follows:

Iron	94.616
Silicon	1.926
Phosphorus	0.251
Graphitic carbon	2.793
Combined carbon	0.310

This pig iron was made, even in that furnace, with its low temperature of blast, on 68 $\frac{1}{2}$ bushels of Glen Mary coke to the ton, and the gas furnished was ample for the boilers without any airing under them. It ranked full No. 1 foundry, and was sold to be made into Bessemer steel. It took 1 $\frac{1}{2}$ tons of Ragland to the ton. The furnace was then thrown back on to Ragland coke, and

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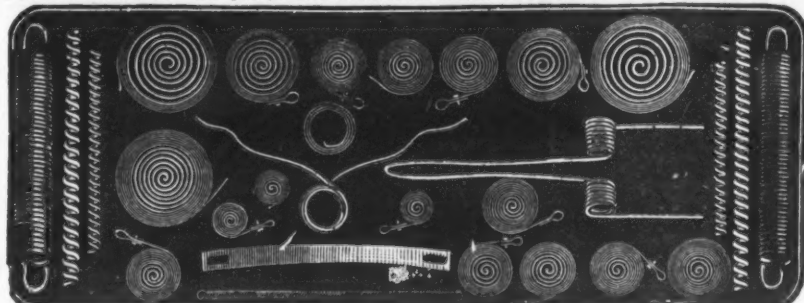
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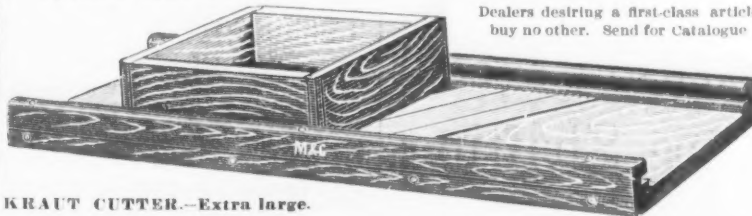
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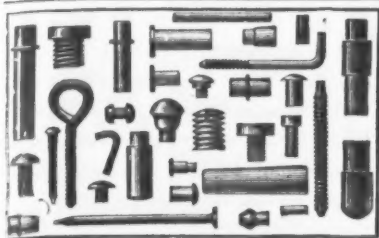


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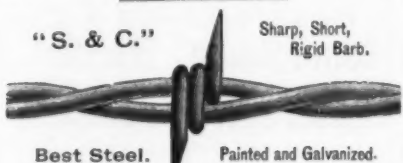
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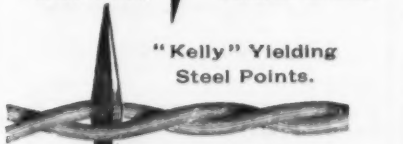
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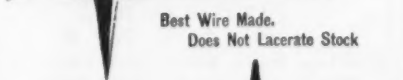
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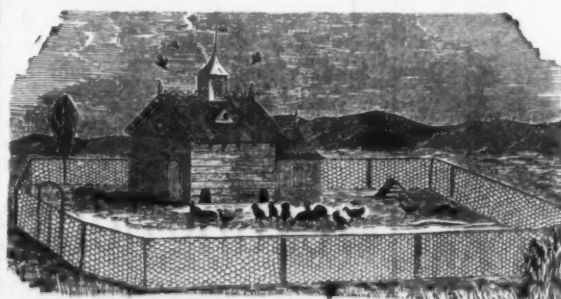
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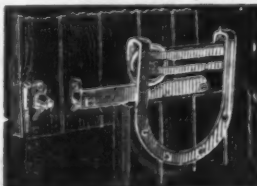
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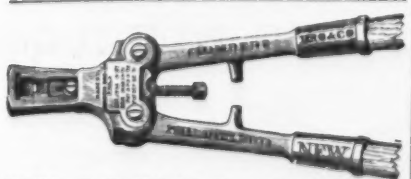
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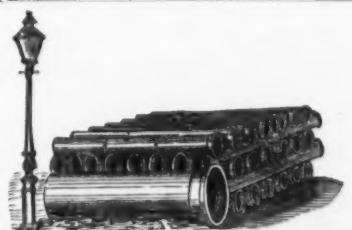
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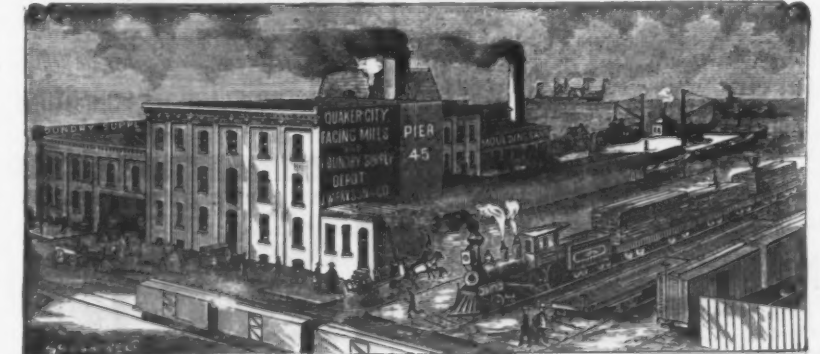
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Employers' Liability in Europe.

The English Government has gathered through its representatives in different countries some interesting information concerning the laws in force to regulate the liability of employers to compensate workmen injured in their service. The following is a summary of these reports as they relate to leading countries on the Continent:
In France the employers' liability is regulated by common law, there being no special legislation with regard to it. The common law is formulated in the Civil Code, and under it employers are, like all other persons, held liable for injuries which have occurred through their own fault or have been caused by their servants in the performance of the functions for which they have been employed. The fact that a workman has been injured through the act of a fellow-workman does not relieve the employer from liability, but it is for the judge to consider all the circumstances of the case to determine what amount of responsibility rests upon the employer, and to assess the damages accordingly. The injured workman is not required as a condition of obtaining compensation to give any special notice, and in the event of no agreement being arrived at between the parties the employer is summoned directly before the judge, who decides finally if the claim does not exceed \$300. When the claim is in excess of that amount both parties have the right to appeal. Employers and employees are permitted to make what contracts as to compensation they please, but the judges have the right to annul any contracts they may consider too prejudicial to one of the contracting parties. The practice of insurance, either by workmen themselves or jointly by workmen and employers, obtains only to a very limited extent, but there is nothing to prevent the employer providing for his liability being met out of an insurance fund, although in the event of that fund proving inadequate he would be liable to make good the amount of the deficiency. Such is present law, and the opinion of M. Treitt, the legal adviser of the Embassy in Paris, is that in practice the procedure under it has only one drawback, that being the tardiness with which judgments are obtained, in consequence of which widows and children are obliged to wait a very long time before they obtain justice. There is, however, a large amount of dissatisfaction with it, and various proposals for its alteration have been brought forward, the chief innovations suggested being, first, to impose upon the employer the obligation to indemnify workmen, even if he should have nothing to do with the cause of the accident; and, second, to make the practice of joint insurance by employers and employed compulsory, the workman to bear at least a third of the cost of insurance.

The German system of compensation is practically a system of insurance. Employers in the various branches of industry in which the risks are considered as similar or equal have been grouped by law into trade associations termed "Berufsgenossenschaften," each association comprising a certain geographical district, and being bound to compensate workmen injured in the service of any employer who belongs to that district. The funds out of which compensation is paid are raised yearly from all employers within the respective districts in proportion to the amount of wages paid by each employer during the year. The workmen are entitled to compensation when injury is suffered in the course of their employment, no matter what the cause may have been, unless it is proved that the injury was willfully inflicted by the man himself, or that he willfully caused the accident. In the event, however, of the accident being deemed by a "criminal court" to have been caused by gross and criminal neglect on the part of the employer or one of his working managers, the incriminated employer or manager is bound to refund the amount which the "Berufsgenossenschaft" has paid to the injured workman. The liability of the employer, or, rather, of the association of which the employer is a member, begins from the fourteenth week after the accident, the workman being supported during the previous 13 weeks out of the "Krankenhasen," or sick funds, to which the employer is bound by law to contribute two-thirds and the workman one-third.

In Austria until June last the liability of employers was regulated by the ordinary civil law. Then, however, a bill was passed which approximated the Austrian system to that of Germany. Under the new law all workmen employed in factories, foundries, mines, shipbuilding establishments and in the building trade are entitled to compensation out of an insurance fund for any injury they may sustain in the course of their employment. The cost of insurance is borne to the extent of 90 per cent. by the employers and 10 per cent. by the workmen, the contributions of the latter being deducted from their wages. The Austrian system is thus essentially one of joint insurance under the compulsion of the law; but, in reporting the passing of the new bill, Sir A. Paget states that it is believed that in the majority of cases the whole premium will be borne by the employer, and the fear is that, if in exceptional cases deductions from wages are insisted upon, "a fertile cause for discussion will be aroused."

Italy at present has no special law on the subject of employers' liability, the workmen coming under the provisions of the common law, which makes the person causing any accident peculiarly responsible for its consequences. For the past three years, however, the Legislature has had under consideration a bill which would render employers liable for all injuries sustained by workmen in the course of their employment, subject to the provision that this liability is to cease when the employers have, at their own cost, insured their workpeople against all kinds of accidents. A bill embodying those provisions passed the Chamber of Deputies in June, 1885, and was under the consideration of the Senate when Parliament was prorogued in April last.

Belgium also has no special law regulating the liability of employers, who come under the ordinary provisions of the Civil Code,

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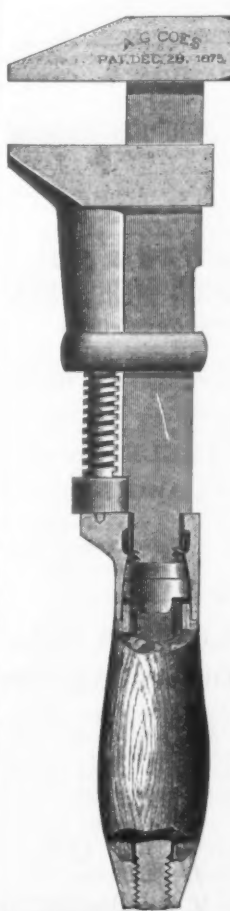
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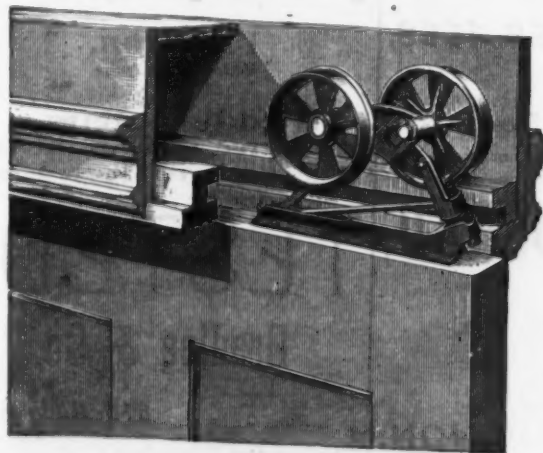
They cannot be equalled in price and quality. Are standard the world over.

For sale by all leading Jobbers at factory prices.

Send for illustrated Catalogue and Price List.

Covert Manufacturing Co.,
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Barry's Patent Parlor Door Hanger.



The only Hanger made that
 will not bind on an
 uneven track.

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SYRACUSE BOLT CO.,

Syracuse, N. Y.,

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Furnace Lamp,

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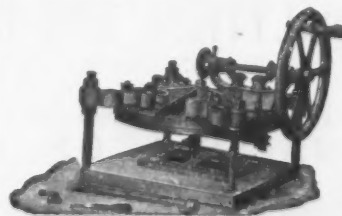
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It has no Seams or Solder in
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**Patent Portable Valve Seat
 Rotary Planing Machine.**

For Planing off the Valve Seats of Locomotive
 and other Engines. Three sizes made for
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Circulars with full description on application.

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WROUGHT IRON

BOILER TUBES.

Steam, Gas and Water Pipe, Oil
 Well Tubing, Casing

AND

LINE PIPE.

Cotton Presses, Forgings, Rolling
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READING IRON WORKS.

261 S. Fourth St., Philadelphia.



Manufacturer of
FRANKLIN S. MILES,
 Iron, Steel and German Silver
SCREWS,
 Brass. 205 Quarry St., Philadelphia.

GLASS The most perfect and non-
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 only in Myers' Pumps.

MYERS' FORCE-PUMP

Adapted to open and drilled wells. The
 only double acting force-pumps furnished
 with expansive plunger bucket and Glass
 Valve-Seat. The only successful
 Well Pump made.

Simple, durable, powerful, easy to operate.
 Never affected by frost.

**MYERS' DOUBLE LOCK
 REVERSIBLE**

HAY CARRIER.

A perfect reversible
 carrier. New Myers'
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 Double and single har-
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**THE
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Manufacturers of

Iron, Brass and Brass-Cyl-
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 Well and Force

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Windmill, Boiler Feed
 Horizontal and Rotary

Pumps.

Hydraulic Rams, Iron
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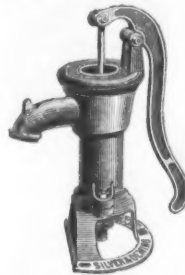
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 of every description,
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HYDRAULIC MACHINERY.

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 Salem, Ohio,
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MANUFACTURERS OF
**CISTERN, PITCHER, WELL AND
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 Wind Mill Pumps, Hand and
 Power Rotary
HYDRAULIC RAMS,
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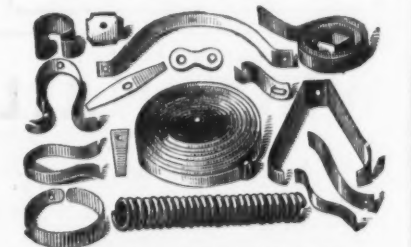
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**BRASS, BRIGHT
 TINNED WIRE
 & JAPANNED
 BIRD
 CAGES.**

The cheapest and
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 market.
 Catalogues and
 Price Lists furnished
 to the Trade.
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Full size of Band for Brass and Tinned Wire Cages.


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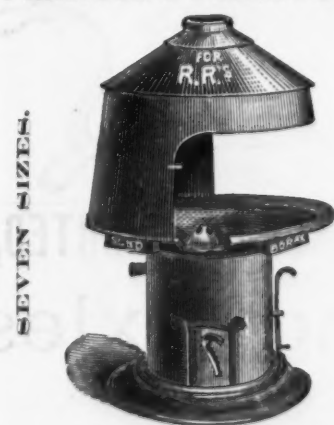
Clock Springs and Small Springs
 of every description, from best Cast Steel.
BRISTOL, CONN.


**FIELD'S
 IMPROVED
 FORCE PUMPS.**

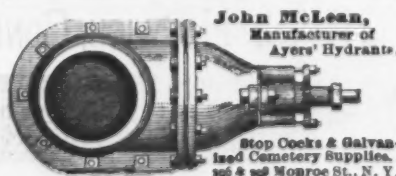
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Household, Orchard
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 Force Pumps,
 Pitcher Pumps,
 Tube Well Pumps.
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 Garden Engine.

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 Manufacturer of
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Stop Cocks & Galvan-
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 205 & 207 Monroe St., N. Y.

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 Works at Tyrone Forges, Blair Co., Penn.

**BEST CHARCOAL BLOOMS
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 ALSO TACK and NAIL PLATE.
 Blooms guaranteed and especially adapted
 for stamped ware.


GEO. M. EDDY & CO.
 Manufacturers of

Measuring Tapes
 of Cotton, Linen and Steel.
 FOR ALL PURPOSES.
 351 to 353 Classon Ave., Brooklyn N. Y.

W. & B. DOUGLAS, Middletown, Conn.,
 The Oldest and Most Extensive Manufacturers of

Pumps, Hydraulic Rams, Garden Engines,
 Yard Hydrants, Street Washers, Galvanized Pump Chain, Wind Mill Pumps
 and Other Hydraulic Machines in the World.



Fig. 120.



Fig. 209.



Fig. 70.

WROUGHT STEEL SINKS.


One of the strong points of these sinks is the new coupling with which they are now supplied, and which is pronounced by all plumbers the best on the market. It is used with both lead and wrought-iron pipe; is a neat, reliable coupling, and is easily detached for the purpose of pumping out the pipe. The strainer and all parts of the coupling are tinned, and are furnished with all sinks without extra charge. The fact of the great strength and durability of this sink, as it is practically free from danger of breakage in transportation, handling or use, is a strong point in its favor, and that its merits are recognized by most competent judges is evident from the fact that leading houses which have been interested in the com- mon article have taken up the Wrought Steel Sink. Twenty-five per cent. is saved in freight by purchasing Steel Sinks. Orders come from all parts of the United States, Canada, Europe and Australia.

BRANCH WAREHOUSES:

85 and 87 JOHN STREET, NEW YORK, and 197 LAKE STREET, CHICAGO, ILL.

UNION MANUFACTURING CO.,
 MANUFACTURERS OF ALL STYLES

Plain and Ornamental Butts,
 LOOSE PIN REVERSIBLE, CAST FAST AND LOOSE.



Drilled and Wire Jointed, Japanned, Fluted Enam-
 eled, Nickel Plated and Real Bronze Butts.
 Also a Full Line of

IRON AND BRASS PUMPS,
 Cistern, Well and Force Pumps, Yard Drive Well,
 Garden Engine and Steam Boiler Pumps, Hydraulic
 Rams, &c., and all with the most modern improvements.

UNION SPIRAL SPRING HINGES.

We beg to call the attention of Architects, Builders, Dealers, and all interested parties, to our Spiral Spring Hinge, knowing it to be an effective and durable one, neat in appearance, easy to put on, and not liable to get out of order. The Springs are made from wire made expressly for us and for this particular purpose, with the view of great elasticity, durability and power. They produce a continuous pressure from the point where the door is wide open until it is closed, and then hold it perfectly in position. It has a solid pintal in connection with short hollow ones, causing little or no friction, the whole power of the Spring being exerted in swing- ing the door. It is Fast Joint, and can be used for either right or left hand, allowing the dealer to carry less stock, and the builder will never get the wrong hand.

FINE CASTINGS A SPECIALTY.

New Britain, - Connecticut.

Warehouse: 103 Chambers Street, New York.
 Illustrated Catalogue and Price List furnished
 upon application.

GEORGE BROOKE, President.

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THE E. & G. BROOKE IRON CO.,
 BIRDSBORO, BERKS CO., PA.,
 MANUFACTURERS OF

ANCHOR NAILS AND SPIKES. BRAND

Capacity, 1000 Kegs per Day.

Made from their own Pig Iron, Insuring Regularity and Superiority in Quality.

**FOUNDRY AND FORGE PIG IRON,
 AND COLD BLAST CHARCOAL CAR WHEEL IRON.**
**OLD DOMINION
 CUT NAILS, BAR IRON.**

R. E. BLANKENSHIP, President.
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NOW BUILDING A TWO-CONVERTER BESSEMER STEEL PLANT.

IRON AND STEEL DROP FORCINGS

All shapes, small and large, including
 GUN, PISTOL, WRENCH BARS, &c. ALSO, DIE SINKING. MANUFACTURERS ALSO
 OF BRICKLAYERS', MOULDERS' AND PLASTERERS' TOOLS,
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L. & I. J. WHITE, MANUFACTURERS OF **EDGE TOOLS,**
 Coopers', Carpenters' and Ship Tools, Plane Irons,
 Cleavers, &c. Full Line Chisels.
 BUFFALO, N. Y.

which renders every person responsible for accidents caused by them or arising from their negligence. The workmen, we are told, desire to considerably extend the employers' liability, and to treat the workman's right to compensation for all accidents as the necessary outcome of the relations between employers and employed, but "these pretensions are not recognized by the law." It is not permissible for either masters or men to contract themselves out of the provisions of the Civil Code, and the tribunals have in each case to decide whether the fact that a workman was injured by the act of a fellow-workman makes any difference as to the employer's liability.

English Letter.

(From Our Regular Correspondent.)
 LONDON, October 11, 1886.

THE IMPROVEMENT

alluded to in my last report has continued and may be said to have been emphasized during the interval. On all sides one hears the cheery remark that "there is no doubt things are better," together with occasional reports showing that not only is the tone better, but that there is actually more business being done. In a few quarters values are higher, while in others there is the expectation that the quarterly meetings of this week will result in several upward changes in prices. So far the amended condition of things appears to have been most conspicuous in certain lines of pig iron, but there are also changes in some few kinds of finished iron and in tin plates, &c. In Scotland the situation has been improved by an accident at Gartsherrie which has had the effect of stopping eight furnaces at those works. In Cleveland the monthly returns show a considerable decrease in the stocks, while the tone of the other classes of crude iron has amended in sympathy with the state of affairs in the two principal districts just named. In sheet iron two failures have led to an advance of from 5/ to 7/6 ton, the more limited output, coupled with the diminished competition, having speedily brought about that result. It is anticipated indeed that black sheets may go up another 10/ or 15/ a ton during the present week, especially as other stoppages of production are deemed probable, not only in the Midlands, but also in the North.

In blooms and billets prices are firmer under the influence of very numerous inquiries from your market, and the same thing may be said of scrap iron and steel, old rails, tin plates, puddled bars and steel sheets. For Canada a big business is being done, especially in puddled bars and steel sheets, both of which are, I understand, largely used in the Dominion for rail-making purposes. Speaking of Canada, I may say that the exhibits sent thence to the Colonial Exhibition here have created quite a sensation and have profoundly impressed our own manufacturers of similar goods. In saying this I am not exaggerating in the least, and know exactly whereof I write. On the whole, therefore, you will rightly gather that we are in a very hopeful mood and are disposed to believe that we have at length passed the worst of the depression and may look forward to better days. Nevertheless I warn your readers that as yet there is no fear of a boom or its incidents. The public, however, are in a booming mood, as is evidenced by the remarkable and continuous rise which is taking place in almost all classes of stock exchange securities. Everything there is going up with a vengeance, and there is as yet no sign of the end or of that "retribution" which is certain to overtake the speculators sooner or later.

THE INSTITUTE MEETING

last week was a greater success than had been anticipated. The attendance was quite large, and the literature was both interesting and useful. In his presidential address Dr. Percy dwelt at length upon the rapid and great growth of your iron and steel industries, the statistics of which he compared with our own in a manner which secured the attention of his hearers. Among the papers read was one by Mr. F. W. Gordon on the South Chicago blast furnaces, and the speakers on other subjects included Lieutenant Jaques, of the United States Navy, and Mr. Witherow, of Pittsburgh. Some of the discussions were very practical and entertaining. The members officially visited the Colonial Exhibition under the guidance of Mr. P. C. Gilchrist and Mr. E. Riley, who had prepared a very useful account of all the minerals shown thereat from the different colonies and India. Some of the analyses of the iron ores show extraordinarily good results. The council of the Institute have elected as president for the next two years Mr. Daniel Adamson, of Manchester, who is the "apostle" of steel boilers and the chief advocate of the Manchester ship canal. He is a good, practical man, and will probably be a popular president.

A LONDON IRON EXCHANGE.

For some time past the iron, steel and tin-plate men have been dissatisfied (and with good reason, as I think) with the London Metal Exchange, which is chiefly devoted to "operations" in tin and copper. They have now decided to hold a daily meeting of the iron and allied trades in the Royal Exchange, a huge building in the very center of the city, in which the members of other trades have long been accustomed to assemble. The first meeting took place this afternoon, and was pretty well attended. No doubt when the thing becomes well established it will prove a great convenience to the trade, the members of which will be very well satisfied to lose the "benefits" conferred elsewhere. The daily meeting is likely to be specially advantageous.

THE IRON MARKET

is decidedly stronger, and the signs of a turn in the tide have become more clear and definite. These signs are exceedingly encouraging. In the Glasgow warrant market an exciting week has been passed, partly owing to a slight failure announced a few days ago, and because other failures were anticipated. Business done, however, has been less speculative, as a firm and upward tone has ruled. The closing price

was 41/7. Shipments have been rather below expectation, but makers' brands have been firm and higher. In Cleveland prices have stiffened by 6d. per ton, and it is stated that makers now hesitate to accept 31/6 for delivery within the next six months. On the West Coast the firmer tendency still rules, and in Staffordshire better rates are obtained. In the finished-iron trades the tone, taken all round, is perhaps less satisfactory than in pig iron, but in some departments the advance is particularly marked, such as in sheets. Black sheets for galvanizers are now from 5/ to 7/6 better than last week, and they are expected to be better still after next week's meeting. Galvanized sheets, too, have improved, and quotations are higher in nearly all cases, ranging from 2/6 to 5/6. Good business continues to be done in scrap and old materials, the present rates being for old double-headed iron rails, 52/6 @ 55/; No. 1 heavy wrought scrap, 40/ @ 42/6; old iron boiler tubes, 35/ @ 37/6; old cast iron, 35/ @ 37/6; old flange rails, 47/6 @ 50, f.o.b. London or other British ports. Freights remain steady at 7/6 per ton for pig iron from Glasgow to New York by ordinary steamer. From South Wales to the Northern ports of the United States freights have stiffened, but to New Orleans and neighboring ports rates are easy. Steel is in good request, and makers are asking higher prices. Blooms for America are in fairly good demand, and in South Wales several thousand tons have been sold on a basis of 67/6 per ton for 7 x 7 inches. Basic blooms are keeping some of the works well employed. Inquiries for steel sleepers are practically nil, nor is there for the moment a prospect of orders being given out. Old leaf-spring steel is quoted at 48/6 @ 50/6, f.o.b. usual ports. Steel rails are now quoted at 23/ 15/ and just at present they are in great demand, there being at least 35,000 tons in the market. The principal inquiries are 3000 tons for Chili, 20,000 to 25,000 tons for Santa Fé, 4600 tons for the South Indian Railway, and a like quantity is required by the Lanark and Ayrshire Railway Company. There will also be issued in a few days specifications for the Northeastern Railway Company for 50,000 tons. The proposed further development of railways in Western Australia has not been abandoned, as reported.

SCOTCH PIG IRON

is firmer all round, the advance in makers' brands ranging from 1/ to 1/6 per ton. The demand is said to be better, consumers having no stock on hand, while the production is being steadily and considerably limited. There are now 60 furnaces in blast in Scotland (52 on ordinary pigs), as against 90 a year ago. In Connal's stores there are 824,909 tons, an addition of 1399 tons last week, compared with 627,350 tons this date last year. The shipments to date are 48,716 tons in arrears to date, while the importations of Middleboro' pig iron into Scotland are 39,378 tons behindhand. Current prices are:

Deliverable alongside.	No. 1.	No. 3.
Gartsherrie, at Glasgow.....	46/	42/9
Coltness, ".....	51/	44/6
Langloan, ".....	46/	42/6
Summerlee, ".....	47/6	42/6
Calder, ".....	47/	42/9
Carnbroe, ".....	43/6	40/6
Clyde, ".....	43/6	40/
Monkland, ".....	43/	39/
Govan, at Broomielaw.....	43/6	38/
Shotts, at Leith.....	45/	44/
Carron at Grangemouth.....	46/6	43/6
Glenarook, at Ardrossan.....	43/6	40/6
Eginton, ".....	43/	39/
Dalmellington, ".....	42/	38/6

MIDDLEBORO' PIG IRON

is steady and 6d. @ 1/ higher in value, with more business doing and a general disinclination to sell far forward. For G. M. B., f.o.b. at makers' wharves in the Tees, net cash, prices are:

No. 1 Foundry.....	33/9	Mottled.....	39/9
" 2 ".....	32/9	White.....	29/3
" 3 ".....	31/3	Refined metal.....	46/
" 4 ".....	30/9	Kentledge.....	33/6
" 4 Forge.....	30/3	Cinder.....	27/6

The returns of the Cleveland Ironmasters' Association for September show a decrease in the make from 207,053 tons in August to 190,720 tons in September, and a decline in stocks from 728,094 tons on August 31 to 720,422 tons on September 30.

HEMATITE PIG IRON

is steadily firm at about 43/ for mixed lots, and West Coast makers' brands as under:

Lonsdale.....	No. 1.	No. 2.	No. 3.
Workington.....	43/3	42/9	42/3
Lowther.....	42/9	42/9	42/3
Distington.....	42/6	42/3	42/
Solway.....	42/6	42/3	42/
Marryport.....	42/6	42/3	42/
Harrington.....	44/	42/	42/3

These prices are still worthy of very close attention on your side. To date this year West Coast shipments are 35,871 tons ahead in pig iron, and 44,663 tons in steel rails. Furnaces blowing, 41, against 39 a year ago.

THE BOARD OF TRADE RETURNS

for the month of September are fairly satisfactory. The imports were valued at £28,808,505, against £29,863,735 in September, 1885. For the nine months there was a decrease of £24,000,000 in the imports. The exports last month were of the value of £18,928,975, as compared with £18,621,604 in the same month of last year. The total quantity of iron and steel exported was 296,348 tons, worth £1,716,089, as compared with 319,671 tons, worth £1,934,390 in September, 1885, thus showing a considerable decrease both in quantities and values. With the United States, however, business is expanding, as is shown by the appended table of the chief exports to your country last month:

Articles.	Month of Sept., 1886.	Month of Sept., 1885.	Month of Aug., 1886.
Alkali, cwt.....	236,563	341,033	247,173
Hardware and cutlery, &c.....	30,510	32,814	31,032
Iron—Pig, tons.....	30,291	10,477	38,867
Bar, angle, rod, &c., tons.....	117	192	173
Railroad, all, tons.....	5,315	230	1,816
Hoops, sheets, plates, &c., tons.....	1,231	2,778	2,228
Tin plates, tons.....	17,012	10,313	19,157
Cast or wrought, tons.....	135	27	95
Old, tons.....	2,490	150	2,577
Steel, unwrought, tons.....	7,874	734	7,736
Lead, all sorts, tons.....	198	—	131
Steam engines, &c.....	8,982	5,229	4,151
Other machinery, &c., &c.....	50,479	20,070	49,315
Tin, unwrought, cwt.....	489	456	272
Special return—Steel rails, tons.....	5,318	230	1,815

Paris, 1878. **McCAFFREY & BRO.,** For Superiority.
PENNSYLVANIA FILE WORKS,
Philadelphia, Pa., U. S.

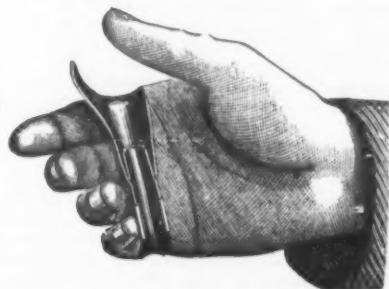
Manufacture and keep in stock a full line of **FILES** and **RASPS** only, for which we claim special advantages over the ordinary goods, and ask domestic and foreign buyers to allow us to compete for their trade.
Superiority acknowledged wherever used, sold or exhibited.

UNIVERSAL CORN HUSKER

[A. W. BRINKERHOFF'S PATENT.]

ADJUSTABLE TO FIT ANY HAND.

Made for Either
Right or Left
Hand.



Can be Worn
over
Glove or Mitten.

Will not make the Hands Sore! Made Entirely of Brass, without Straps, Web or Elastic Band.

WRITE FOR PRICES AND DISCOUNTS.

JOHN H. GRAHAM & CO.,

Sole Manufacturer's Agents,

113 CHAMBERS STREET,

NEW YORK CITY.

IRON ROOFING
SIDING, CEILING,
ARCHES AND LATH.
CINCINNATI
CORRUGATING CO.
+ CINCINNATI, O. +
SEND FOR ILLUSTRATED CATALOGUE.

LIGHTNING HAY KNIVES.

WEYMOUTH'S
PATENT.



This knife is the best in use for cutting down hay and straw in mow and stack, cutting fine feed from bale, cutting corn stalks for feed, cutting peat and ditching marshes.
The blade is best cast steel, spring temper, easily sharpened, and is giving universal satisfaction. A few moments' trial will show its merits, and parties once using it are unwilling to do without it. Its sales are fast increasing for export as well as home trade, and it seems destined to take the place of all other Hay Knives.
They are nicely packed in boxes, one dozen each of 60 pounds weight, suitable for shipping by land or water to any part of the world.

MANUFACTURED ONLY BY
HIRAM HOLT & CO., East Wilton, Franklin Co., Maine.
For sale by the Hardware trade generally.

CAUTION:

We are informed that various parties are infringing upon the widely known Letters Patent granted originally to George F. Weymouth for an improved Hay knife.

The characteristic feature of the invention is a curved blade, provided with saw-tooth cutters, and furnished with suitable working handles. It is our purpose to prosecute all infringements, and to hold responsible to the full extent of our ability and of the law all parties who manufacture any knife infringing upon the patent, or who deal in the same. Several suits have been already ordered.

All manufacturers and dealers are hereby warned of our rights, and the public are cautioned against purchasing any Hay Knives which are not of our genuine manufacture.

HIRAM HOLT & CO.

EAST WILTON, May 10, 1886.

RIVERSIDE IRON WORKS,

MANUFACTURERS OF RIVERSIDE

STEEL NAILS

Pig Iron, Bar Iron, Bar Steel, Steel Blooms, Steel Billets,
Small T Rails, Flat Rails of Iron or Steel, Fish Bars of Iron or Steel.

WHEELING, W. VA.

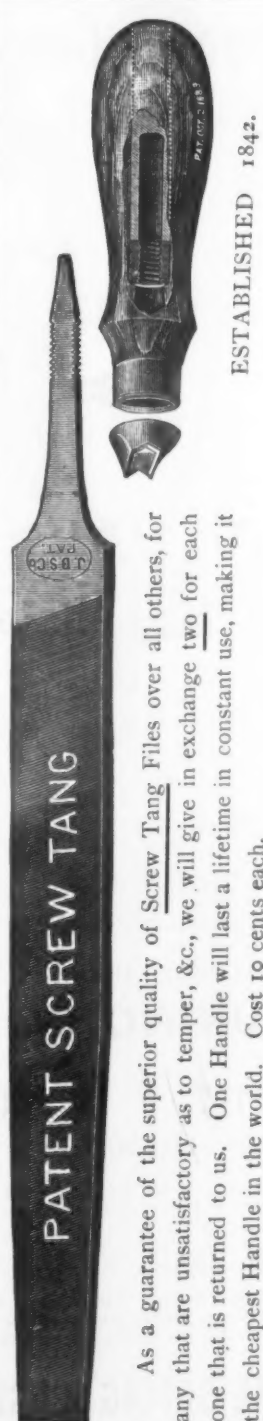
TACKS AND STAPLES
A COMPLETE LINE OF
Double Pointed & Steel Wire Tacks, Blind, Bed Spring, Telephone & other Staples.
The Large Head 1 1/4, 1 1/2, Full Weight.
Steel Wire Tacks Uniform, Dbl. Uniform
are put up either in 100 or 200 papers.
Outside of all combinations.
Send for Catalogue.

Worcester Tack & Staple Co.
S. H. LARNED,
Worcester, Mass.

TACKS AND LINING NAILS AND TUFTING BUTTONS.

BOSTON SALESROOM, BALTIMORE SALESROOM, CINCINNATI SALESROOM, NEW YORK SALESROOM,
70 Portland St. 29 Hanover St. 349 Main St. 116 Chambers St.

AMERICAN TACK CO., FAIRHAVEN, MASS.



PATENT SCREW TANG

As a guarantee of the superior quality of Screw Tang Files over all others, for any that are unsatisfactory as to temper, &c., we will give in exchange two for each one that is returned to us. One Handle will last a lifetime in constant use, making it the cheapest Handle in the world. Cost 10 cents each.

ESTABLISHED 1842.

J. BARTON SMITH CO.,
Philadelphia, Pa., U. S. A.

GILBERT PARKER, President.
S. A. HAINES & CO., Agents, 90 Chambers St., New York.

Chapman Valve Mfg. Co.,
MANUFACTURERS OF

VALVES AND GATES

—FOR—

Water, Steam, Gas, Ammonia, &c.

GATE FIRE HYDRANTS,

with and without

INDEPENDENT NOZZLE VALVES.

All Work Guaranteed.

Works and General Office.

INDIAN ORCHARD, Mass.

Treasurer's Office

72 Kilby and 112 Milk Streets,
BOSTON, Mass.

A Perfect Dust Pan at Last.



Every Pan is made of All-Steel Tin Plate, and re-enforced at the edge with a piece of Tempered Steel, 1 1/4 inches wide, extending the length of the front and beyond the edge of the pan, which causes it to be always straight and close-fitting to the floor. Cannot become bent or distorted at the edge, and all dirt or dust can at once be brushed on the pan.

THE STEEL EDGE DUST PAN CO.,

Manufacturers,

6 Exchange Place, Boston, Mass.

THE FAIRY TRICYCLE.



Durable and cheap; runs the easiest; no chains or gearing to catch or tear clothing. A good hill climber, and can be ridden where other machines fail. For adults, invalids and children. Agents wanted.

THE FAY MFG. CO., Elyria, Ohio.

CARRIAGE HARDWARE.

LARGEST LINE OF

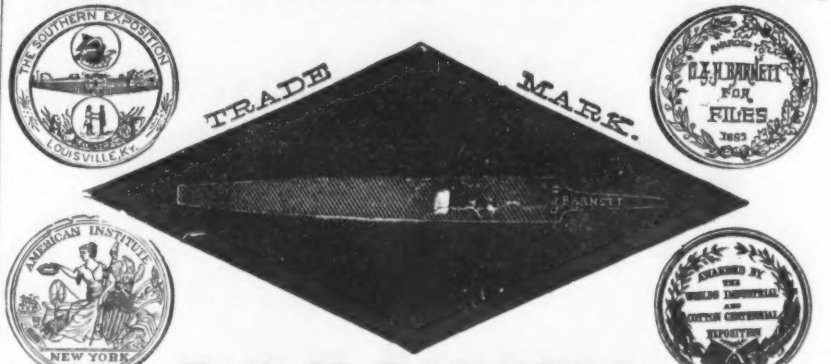
WROUGHT CARRIAGE FORGINGS

MADE BY ANY HOUSE.

Send for Catalogue and Discount Sheet.

The E. D. CLAPP MFG. CO.,
AUBURN, N. Y.

BLACK DIAMOND FILE WORKS.



G. & H. BARNETT,
21 to 43 RICHMOND STREET, - - - PHILADELPHIA.

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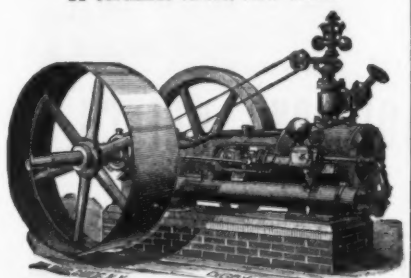


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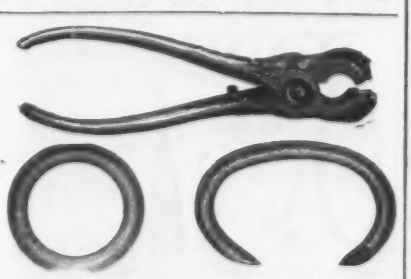


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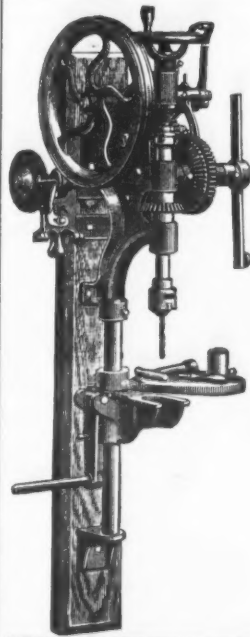
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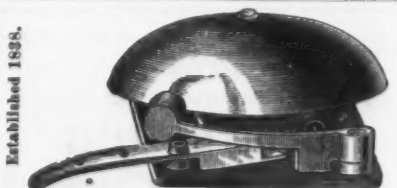
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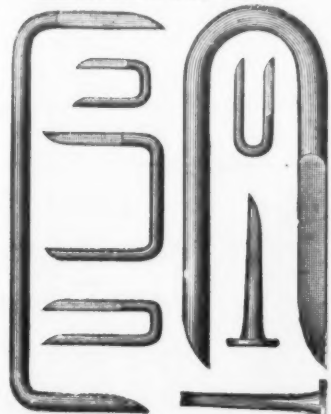


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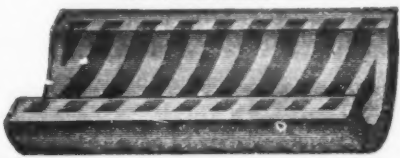
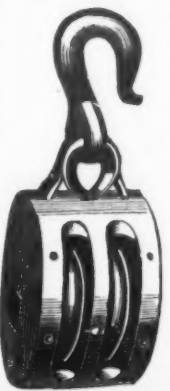
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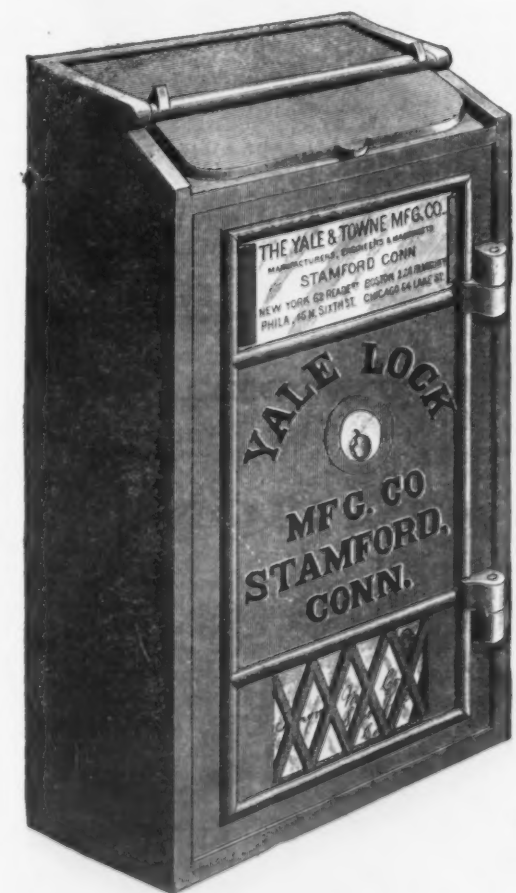
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THE WEEK.

The Hell Gate electric light will be discontinued as being dangerous to navigation. Pilots state that while they can see well inside the circle covered by the light they are unable to see beyond.

Owen Sound, Ont., one of the principal ports on Georgian Bay, bids fair to outrival either Collingwood or Midland as a grain-receiving port. Quite a number of vessels have recently been loaded for that port at Chicago.

Thirty skilled ship carpenters from Maine arrived in Chicago under a contract to work in one of the local yards, all of them Knights of Labor in good standing. While there was no ground for driving them away, the determination to prevent their going to work was so manifest that nearly all soon started for home, expenses paid.

At Pittsburgh on Saturday Judge Stowe entered a decree in the case of the Bessemer Steel Company vs. Jacob Reese. After stating that the court did not think it right to dismiss the bill, as the master had recommended, the defendant is ordered to assure to the plaintiffs the several patents found by the master to belong to them, upon payment of the money due under the contract of 1881. The defendant is awarded interest upon the amount due to him. The plaintiffs are to pay the costs of the suit. The amount due is \$25,000, with interest from March 20, 1882, and \$5,000 per annum for 17 years. The patents affected by this decree do not include the basic process.

Thomas W. Frederick, a well-known master mechanic of Buffalo, died in Para, Brazil, October 3. He represented the Westinghouse Air Brake Company.

Two mills are at present being built, one at Kenosha, Wis., for rolling brass, and the other at Detroit, for rolling both brass and copper. The Detroit mill will cost \$40,000.

Benjamin H. Folsom, the newly appointed United States consul to Sheffield, is a lawyer by profession, about 40 years of age, and is supposed to be thoroughly competent to fill the position.

The first heavy wire cable laid in the Sixth avenue subway, comprising 920 feet, was tested and found to work successfully. It was drawn two blocks at once with the aid of a windlass.

The French ambassadors at London and Vienna have moved simultaneously in a protest against the further British occupation of Egypt. Germany, it is intimated, should take the initiative. France declined joining in the occupation of Alexandria, but is now apparently of a different mind.

The new treaty between Spain and Great Britain gives all Canadian products entrance into Spain and the Spanish Antilles under the same condition as if Canadian vessels were flying the Spanish flag. This gives them the third column rate of duty instead of the fourth. The effect will be to confine all Canadian exports to their own flag. Should the Madrid Cabinet replace all American imports and vessels under the fourth and highest class in the colonial tariff, by way of reprisal the Cuban representatives say that all the carrying trade of West Indian sugars will be transferred to other countries.

John Lawler's new railway pontoon was successfully launched at Prairie du Chien, Wis., on Monday. It is to span the east channel of the Mississippi River at that place for the passage of the trains of the Chicago, Milwaukee and St. Paul Company. It is over 400 feet long and 40 feet wide. More than 1,000,000 feet of lumber were used in its construction. It cost \$45,000.

An iron lighthouse to be erected on the Fourteen-Foot Bank, Delaware Bay, is being constructed at the H. A. Ramsay Engineering Works, in Baltimore. The lighthouse will stand on an iron caisson already in position, and the focal plane of the lantern will be 59 feet above the sea. The structure will consist of a gallery 40 feet in diameter, surmounted by a cast-iron parapet and rail, with iron cranes or boat davits. From the parapet will rise an iron octagonal structure 26 feet in diameter, three stories in height, surmounted by a tower in which there will be a watchroom for the lantern keepers. On this tower will be an ornamental gallery and the lantern. The completed lighthouse was erected in the works of Mr. Ramsay and inspected by the United States officials having charge of the work, and the first consignment of the tower has left Baltimore.

Lord Randolph Churchill refers to the great commercial activity in America, and to the recent rise in the prices of many articles, such as india-rubber, pig lead, quicksilver, coffee and wool, as distinct and definite signs of a revival of trade and of commercial enterprise. "Our American friends," he says, "are always ahead of everybody else."

It is semi-officially reported from Japan that the result of the revision of treaties with various nations, which is about consummated, increases the tariff from 5 per cent. on imports to, in round numbers, 10 per cent. Some articles remain at 5 per cent.; staples, like cotton, woollens, &c., 7½ per cent., and up to 20 and 25 per cent. on lux-

uries. The country is to be thrown open to residence and commerce. The present system of passports is to be done away with. At treaty ports, such as Yokohama, Hiogo and Osaka, consuls of various powers continue their jurisdiction five years, at the expiration of which the Japanese take it completely, subject to the proviso that foreign judges sit on the bench with Japanese judges.

Brick and iron will be the materials chiefly used in the rebuilding of the burned city of Eastport.

Consul-General Heap, at Constantinople, reports that tariff negotiations between the Ottoman Government and foreign powers have been suspended on account of a disagreement in regard to the duty upon ready-made clothing.

Gen. H. R. Jackson, ex-minister to Mexico, says the future of Mexico is full of promise, though the donkey is still a formidable rival of the steam engine.

The Schreidt & Miller Foundry, at Mansfield, Ohio, was destroyed by fire on the 22d inst. The contents consisted of machinery valued at \$60,000, and stock \$10,000. The building was worth about \$20,000. The company employed about 100 hands, and for two weeks had not been running at night. A watchman was on duty, but did not discover the flames until too late. The loss is hard to estimate, because of the inability to learn whether the machinery is a total or only a partial loss. The insurance amounts to about \$18,000. The company have recently received liberal propositions to move to other points, and it is thought the fire will result in the removal of the works.

The St. Louis Exposition closed on Saturday, and the net proceeds are upward of \$60,000.

The machinery department of the American Institute Fair is now well under way.

A great fire in Farmington, Me., 22d inst., destroyed 33 dwellings, 19 stores, 3 churches, a plow factory and many other valuable buildings. The loss is at least \$250,000.

It is surmised that the Stewart mansion in this city, which cost about \$3,000,000, exclusive of \$2,000,000 expended in paintings, bric à-brac, &c., will soon come into possession of the city as a permanent memorial of the deceased. His surviving life-partner, Mrs. Cornelia Stewart, died of pneumonia on Monday, aged 83 years.

The valuation of Pittsburgh for 1886 is \$131,656,032, which is an increase of over \$12,000,000 in the last three years.

The pattern shop of the Cleveland Foundry, in Winter street, was burned out 21st inst., and many valuable patterns were either destroyed or rendered useless. Bowler & Co., the proprietors, estimate their loss at \$8000.

Many of the largest cotton spinners in England call the attention of the Manchester Chamber of Commerce to the serious deterioration in the quality of Egyptian cotton which has been going on for several years.

The new Erie Railway Station at Jersey City will soon be completed at a cost of \$100,000. It is built principally of sheet iron.

Col. Chas. Whittlesey, who died in Cleveland a few days ago, was largely instrumental in discovering and causing the development of the great iron and copper region of Lake Superior. Twenty-six years ago he was stationed on Eagle River as an agent of an extensive copper company, and at that time discovered a now famous range of iron ore.

A "back draft" blew the coals from the fire-box under the boiler of Calkins & Co.'s planing mill in Tonawanda, and the entire concern, including much valuable machinery, was destroyed.

It is estimated that 30,000 men were in line in the parade of the Knights of Labor at Philadelphia on Saturday in honor of returning delegates from Richmond.

According to the Chicago Tribune the pork packers have adopted a winter scale of wages, which is not only in advance of that heretofore paid, but better than that paid in other cities in the same line of business. In this scale the minimum is \$1.75 and the maximum \$4.50, and the average in round numbers is \$3. The men are getting more for two days' work of 10 hours a day than they could get abroad for six days' work of 12 hours a day, besides buying more with their wages, owing to the cheapness of meat.

The United States consul at Havre says with reference to the prohibition of American pork: "It is very clear that nothing short of placing powers of retaliation against French produce in the hands of the President will bring the French Government and the Chambers to their senses."

Fifteen men were imprisoned in a caisson in the middle of the Missouri River while preparing the foundations of the new Union Pacific bridge at Omaha. A leak was already beyond control, when George A. Ledderlee, chief engineer in charge of the work, and his assistant hastened to the caisson and at once proceeded to extricate the imperiled men. Mr. Ledderlee ran an engine with pumps attached to the pier, and set it to work pumping the water from the

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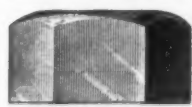
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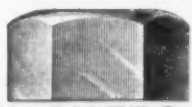
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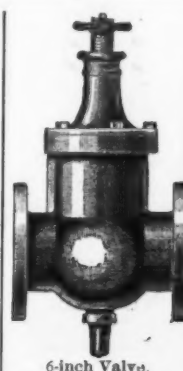


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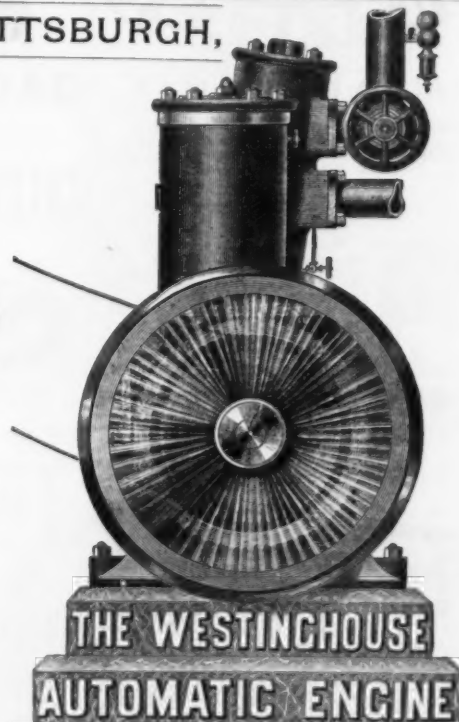
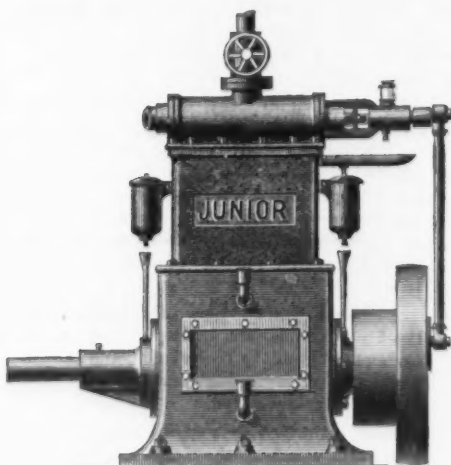
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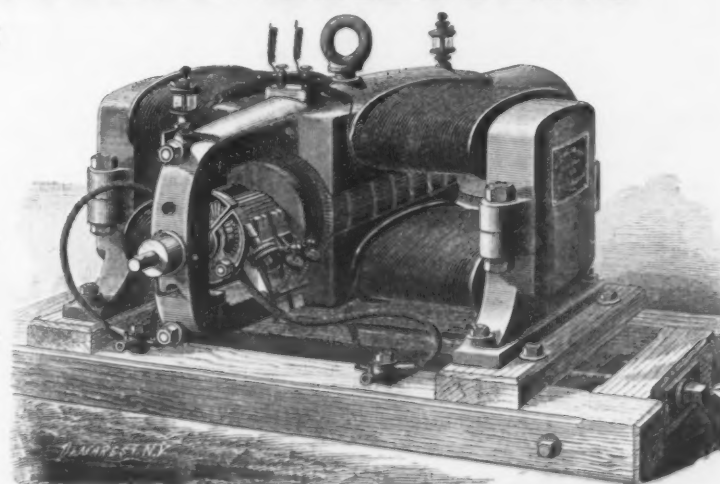
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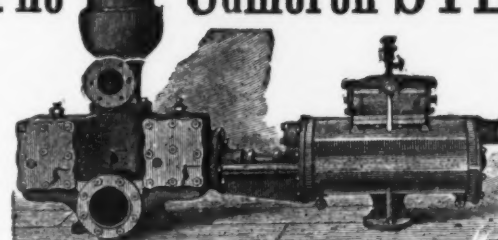
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shaft. After working an hour it was found that the engine was inadequate for the work of rescue, and a bucket brigade was then organized among the bridge employees, who with ropes and buckets slowly bailed the water out of the shaft. This was slow and tedious work, and when the men had been imprisoned over three hours in the caisson nearly everybody despaired of ever seeing them again alive. Finally the water was exhausted and the men were saved.

After protracted negotiations the steamships of the Inman Line are to be transferred to an American corporation known as the International Steam Navigation Company, of which the Pennsylvania Railroad Company are the backers. Peter Wright & Sons are the agents, who intimate that the company intend to enlarge the fleet, putting it in the front rank of Transatlantic lines. The consideration paid is understood to have been \$1,025,000. The liabilities of the Inman Company to secured creditors amount to £174,500, and those to unsecured creditors £91,000, including tradesmen's bills aggregating £49,300. The company's steamers are valued at £168,800. The unsecured creditors will, it is said, receive over 10 shillings in the pound. The American company, being among the largest creditors, could well afford to offer more for the property than any others. The fleet consists of the steamers City of Chicago, City of Berlin, City of Richmond, City of Chester and Baltic.

The new route to Europe via Hudson's Bay gives promise of becoming a reality, so some of our lake editors seem to believe. There would be no doubt of the success of the new route if ships were not compelled to go 5° further north to pass through Hudson's Strait and reach the Atlantic. There the period of navigation is not likely to be more than three and a half or four months on an average, and may prove to be considerably less. Light draft steamers and barges on the Saskatchewan and the Red River of the North could be used to carry grain to some point on Lake Winnipeg, and then 300 or 400 miles of rail transportation would take it to the port where ocean steamers would load for European ports. From many parts of the great Northwestern wheat region the saving in distance would be 1000 to 1500 miles as compared with the New York route. The feasibility of the project is by no means certain.

The iron ship Loraty will be converted into a coal barge for the Boston Towboat Company, whose fleet will have a capacity equal to 10,000 tons per trip of 40 hours between Philadelphia and Boston.

In the new ships for the United States Navy a device will be introduced which effectually protects the magnetic needle from the disturbing influence of the iron used in the ship's construction and equipment. The object is gained by an arrangement of counter magnetic currents.

The growing sugar cane in Cuba has acquired an extraordinary development for this season of the year, owing to copious rains.

French engineers with Lesseps at their head are advocating another grand canal project—namely, widening and deepening the Garonne River to a point where it connects with the Canal du Midi, near Toulouse, and then enlarging that canal to its termination on the Mediterranean Sea. The idea is to afford water communication for vessels of the largest size between the Mediterranean and the Atlantic. Bordeaux would then be made accessible at all times to steamers of the largest class. Moreover the new route would be of immense advantage to American commerce. The present long detour of the Spanish Peninsula could be avoided. Ships could sail from New York direct to Marseilles, Genoa and all the ports of North Italy.

Rolled-iron beams and stairways of iron and slate are being used in the rebuilding of the St. George flats, burned some time ago.

New railway connections for Pittsburgh, promised by Mr. Garrett, will place that city on the main line of the Baltimore and Ohio Railroad, and next year, according to one of the local journals, will see the entire project realized.

The arsenals of Germany, England and Italy are directing all energies to the conversion of their small arms into magazine rifles. The Germans are sanguine that their new weapon will prove to be the most startling and effective manual implement of modern warfare, and will form the basis for future experimenting in the science of close-range gunnery.

The president of the American Gas Light Association, A. E. Wood, of Syracuse, stated in his address before the annual convention in Philadelphia last week that there are 1080 gas companies in the United States and Canada. Of this number 153 are set down as water-gas plants, which number includes small plants erected for lighting factories, mills, summer residences and hotels, as well as those used as auxiliaries to coal-gas works.

There is a better prospect for trade with Central America. The Honduras and Central American Steamship Company have contracted for the construction of two new steamers that are being built upon the Clyde, in Scotland, to be 245 feet in length, 35 feet

beam and 18 feet 6 inches depth of hold from main deck. They are to have a guaranteed speed of 13½ knots on a consumption of 20 tons of coal per day, and a cargo capacity of 15,000 barrels. They will be especially adapted to carrying fruit, and will make the voyage from New York to Belize in six days, and from Costa Rica to New York in seven days and a half. The first steamer will be ready to take her place in the line March 7, 1887, and the second will sail from here March 28, and thereafter will leave New York every three weeks. The ports of call which this line covers include Belize in British Honduras, Livingston, Guatemala, Puerto Cortez, Ruanan and Truxillo in Spanish Honduras, and Boca del Toro, Costa Rica.

A school of technology is about to be established in Atlanta, Ga. The city gives \$100,000 and an annuity of \$2500, while the State Legislature appropriated \$70,000 for the building. Atlanta is determined to make the school the finest in the United States, and if \$50,000 more is needed it can easily be secured.

The New York Aqueduct Commissioners now call for \$7,000,000 instead of \$5,000,000 for the ensuing year's expenses, the additional \$2,000,000 being necessitated by the Sedon Bridge dam estimates.

Reducing fares on all the elevated railways in this city will result in augmenting the traffic to hitherto unknown proportions, and the increased weight of trains will tax the strength of the metal structure supporting the tracks to an extent which the projectors could hardly have anticipated. Incessant vigilance will be needful to maintain the roads at the high standard indispensable to safe transportations.

The Hudson River Ore and Iron Company has purchased the Cold Spring furnace, which will be started up again after being idle several years.

A special committee of the New York Board of Education report in favor of manual training, and recommend the appropriation of \$50,000 to begin the experiment, either by establishing separate schools or by making it a part of the regular course of instruction in all the schools. Lofts might be rented, if necessary, for the introduction of power.

The creditors of the Northwestern Car Company, which failed with liabilities amounting to \$1,751,000, petition for a sale of the assets.

A submarine tunnel for railway purposes is to be commenced immediately under the St. Clair River, Michigan, to connect Port Huron with Sarnia, in Canada. It will be 1 mile in length, of which 2300 feet will be under the river, 1160 feet under the ground in Canada and 1800 feet under ground on the American side. The cost has been estimated at \$1,500,000. The tunnel will be of brick, circular in shape, with walls 30 inches in thickness. A careful estimate of the cost of a double track, it is said by the engineers, shows that it is more economical to build two single-track tunnels than one double-track tunnel. Careful surveys and borings have been made and the feasibility of the project is deemed beyond doubt. The excavation will be mixed rock, grave and clay. Two companies have been organized with capital of \$1,000,000 each, one on this side and the other in Ontario, and these will be combined into a joint organization.

Bockmann, a Berlin architect, has contracted with the Japanese Government to erect at Tokio a large palace for the future Imperial Parliament, a palace for the Ministry of Justice and another for the police administration. All are to be built in European style.

The jurisdiction of trades unions is more clearly defined by a case in the courts arising from an injunction obtained by Mr. Thomas, the musical director, to restrain the Musical Protective Union from disciplining the members of the orchestra who played with an obsequious performer from Germany. Judge Potter made the injunction permanent, holding that the by-laws of the union forbidding its members from playing with non-members are "in restraint of trade and against public policy and void." The same principle of law makes illegal all rules of trade unions or other organizations which compel their members to leave their employment when non-union men are employed with them.

The public lands sold last year embrace an area of nearly 21,000,000 acres, and the amount received by the Treasury was \$7,636,767. The largest sales were in Kansas, namely, 5,636,824 acres. Nebraska and Dakota were next in order with upward of 3,000,000 acres each. By the removal of Indians from the reservation lands in Minnesota over 3,000,000 acres will be thrown open to settlement. The pine lands are easily worth \$35 per acre, while some other parts are practically worthless.

There is a large falling off in the number of sailing vessels arriving at this port compared with one year ago. This is especially true of British sailing craft, excepting vessels from Nova Scotia and New Brunswick. One of the oldest New York shipowners was heard to remark the other day that "there is no money now in sailing vessels—there never will be again."

The Iron Age

AND METALLURGICAL REVIEW.

New York, Thursday, October 28, 1886.

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The Steel-Rail Trade.

The market for steel rails is in many respects the best guide of the future of the trade. Rails are the heaviest item in the purchases of the largest customers of our iron and steel works, the railroads, and there is not a single item on the list of products in which contracting is done so far in advance. In the march of improvement rails are ever in the van, and while prosperity in that particular industry does not by any means imply a revival in other branches, as the history of the past year has shown, it does foreshadow an improvement. A heavy demand for rails means a large consumption of pig iron and of ore, and the relieving of pressure of competition in other lines. It indicates directly, too, a revival in the inquiry for the many forms of iron and steel for equipment and rolling stock. The past year has clearly shown to what extent the condition of the rail trade may be relied upon as an indicator of the future, and what also its limitations are. The iron trade is looked upon by many as the barometer of general business. In a similar manner the rail trade might be singled out as the barometer of the iron trade. Looking at it from this point of view, a study of the condition of the market possesses a special significance. If rightly interpreted it may serve as a guide of much value for other industries. We have seen during the past year how the demand for Bessemer pig helped the makers of foundry grades, by diverting into the former trade considerable capacity which otherwise would have pressed upon the market. Had it not been for the opening up of the Gogebic and Vermillion mines in the Northwest, and for the growing use of Cornwall and of foreign ores in the East, raw materials would have rushed upward long since. These additions to the supply, and the increase in the capacity of the rail mills and of the outside Bessemer works, together with the low prices of foreign crude steel, were the principal factors which kept values in other lines back, and, we may add, increased the profits of the rail mills. The latter, therefore, for nearly a year occupied an isolated position, widely misunderstood. Their influence upon other branches was counteracted by the circumstances alluded to.

One of the most striking features in the markets has been the heavy business done in rails for 1887 delivery. The mills usually make every effort to conceal their transactions at his period of the year, since it largely reveals their policy. A good deal is done in a quiet way at concessions, so that generally the estimates of the orders booked in the aggregate are apt to be below the truth. We have heard widely differing figures quoted, but leading authorities in the trade agree in pronouncing the business done thus far heavier than that of any previous year,

with the exception, possibly, of the last, when buying was stimulated by a rising market. Until lately the railroads have held back, but the conviction has been gaining ground that there was little to be gained by waiting, and possibly much to be lost. Thus far purchases have been made principally by old roads for renewals and extensions, which, it may be stated at once, would not suffice to keep the mills busy, but there are so many evidences in financial circles of maturing railroad enterprises that little doubt is felt concerning the development of a demand large enough to require full work in 1887 of our enormous capacity. The latter is now certainly 1,400,000 gross tons and may be 1,500,000 gross tons per annum. We have reason to believe that fully one-quarter of it has already been taken care of at prices which in some instances have been a little below \$34 at Eastern and \$37 at Western mills, but which have certainly been very satisfactory. So far as it is possible to judge at this comparatively early date the rail mills will have all the work in 1887 which they can do, and it is believed by many that possibly importations will be necessary on a larger scale. It is certain that the outlook is very bright indeed, and that it cannot help influencing other departments. The question is even now being raised as to whether our own mines can turn out enough of the purer grades of ore to supply the demand for old and new Bessemer works. If it were not for the new regions of the Northwest we would unhesitatingly state that they could not. As it is, there may be a temporary scarcity before the opening of navigation, but there seems little danger of an ore famine, even if we do not import at a heavier rate than during 1886. Those who are engaged in the latter business have not thus far shown much disposition to hold out for higher prices than those realized for this year's contracts. Considerable business has already been done on that basis.

The outlook for a good demand on the part of the railroads is therefore very bright. The other great outlet for iron, steel and its manufactures, the demand from a variety of industries, the building trades and the farmers, has been less promising. This is shown by the course of two of the principal "leaders." Nails have dragged along in a very discouraging way, and wire in its many forms has been exceptionally weak for months. In the one case an enormous capacity, and in the other the competition between cheap foreign raw material against a growing domestic industry, have been chiefly responsible for this state of affairs. These industries may only feel the first impetus to higher prices through an advance in the crude materials both at home and abroad, indirectly brought about by the heavier consumption of the railroads. Entering as they do upon a period of dullness inseparable from the winter season, they can only be expected to develop strength as the spring season begins to open. We may sum up by stating that from present indications in the rail trade there is every prospect of a healthy condition of business. A "boom" is fortunately improbable in view of the abundance of raw material, backed by ample productive capacity, low foreign markets, and the prevalence of a feeling among the influential men in the trade against any kiting.

The Silver Question in England and India.

Silver declined to 42½d. per ounce during the summer, but has now gone up to 45½d.; in July last year it was worth 49½d. in the London market, so that it is still considerably below the price even at that time. On September 6 the British Treasury Office intrusted a royal committee with the investigation of the changes which have lately occurred in the relative value of gold and silver, the report to bear on two essentially distinct phases of the subject. The first portion embraces a series of queries relating to the historical and theoretical nature of monetary questions. These queries were fully answered to years ago by the committee of investigation appointed to study the silver and Indian exchange question, and presided over by Mr. G. Goschen. Innumerable pamphlets have appeared since, and the subject has been ventilated to such a degree that business men and the public generally attach comparatively little importance to that part of the work the new committee is to perform. In fact, there is some impatience in the public mind while waiting for a reply. The fluctuations in and depreciation of silver since 1876, when the average was 53d., are facts, and it is really of little importance to know whether the new committee attribute them to the growing scarcity of gold or an excessive production of silver. However thoroughly the new committee may examine that part of the subject, there is little hope that a practical remedy will be suggested.

The second part of the report will require the committee to suggest what measures may be taken by the Government, alone or jointly with other Governments, to determine and agree upon a fixed proportion of value to be adopted between gold and silver. The committee may recommend another attempt, like the International Conference of 1881, to agree with other nations on the free coinage of both gold and silver and fix their relative value, which would have to be 21 to 1 instead of 15½ to 1, but it is a foregone

conclusion that the British Government will decline to change the principle of the sole gold standard in the United Kingdom, inasmuch as it is absolutely impossible to fetter gold in its value relations to silver or any other commodity. Besides, it is a matter of indifference to the people of England whether or not Continental nations or any other not on the gold standard are grappling with never-ending difficulties arising from the instability of silver. There is but one interest which presses itself on the consideration of England—its relations, commercial and financial, with India. Positive hardship arises to India from the silver standard, and the loss on exchange constitutes a heavy item against both its exchequer and trade with England and other countries, rendering it desirable, and even indispensable, that something should be done to change in India a monetary state of affairs that has become well-nigh intolerable.

What the committee may finally decide to recommend in dealing with this question is of paramount interest. It is indeed suggested to introduce in British India the sole gold standard, and thereby take the bull by the horns. The customs returns of India show that during the 50 years from 1836 to 1886 there were imported £137,083,018 of gold, while the export did not exceed £9,194,915, so that the enormous amount of £127,888,103 was retained, Ceylon not being taken into account. The bulk of this gold has been absorbed in the shape of jewelry by the people and hoardings by the native princes. It is estimated that the adoption of the gold standard would set loose, if not all, at least a considerable portion of this gold accumulation, and cause it to reappear in circulation. The experience in the United States, Italy and the Scandinavian countries has proved during the past 15 years that not only the resumption of specie payment, but even the introduction of the sole gold standard, can be carried out with a great deal less actual gold than was supposed to be necessary. Thus, in the Scandinavian countries, where gold is the exclusive standard, there circulate but \$5,600,000 gold coins alongside of \$53,200,000 bank notes and silver. The modern organization of the check system, of gold certificates, &c., would reduce, it is assumed, the amount of gold actually needed for the purpose in India to a comparatively moderate amount; hence it is not believed that any very great extra supply would be necessary outside of the current gold importation into India, now so considerable, for the reason that there silver is the sole standard and the people are hoarding gold. It is further urged in favor of this, the only true and permanently practical, though apparently heroic, measure, that the silver rupees will continue in circulation as fractional coin.

When we consider that out of a total trade of £642,000,000, which the United Kingdom did last year, the large amount of £78,000,000 was exchanged with British India, it is evident that both countries are commercially and industrially, as well as financially, so dependent upon each other that it is well worth while to make a great effort for the purpose of setting at rest, once and forever, this vexed question of the Indian exchange, which in 1884 entailed on the Indian Government a loss of £3,838,756, when the average value of the ounce of bar silver in London was still 49½d. How much heavier this loss would be if silver should decline to 40d. on an average in any given year can readily be seen. Great practical interest attaches, then, to the forthcoming report of the commission. Should they recommend, as is not improbable, the introduction of the gold standard in British India, it can hardly fail to exercise a powerful influence on the policy of other nations in dealing with silver. That influence will be all the greater should the monetary change in India be accomplished without trouble of a serious kind, as promised by its advocates. The existing evil is indeed so great that to get rid of it some inconvenience must be borne in the beginning. If the money to be saved on the exchange thereafter be employed in perfecting the railroad system in India a permanent blessing would be conferred on the country, and before this century comes to a close its commercial and industrial grandeur would be truly overshadowed as compared with any other possession of Great Britain.

From a number of quarters have come to us objections against quotations on foreign materials which call for some reply on our part. It should be stated at the outset that, unless accompanied by specific data as to quality or conditions, quotations cover ordinary grades only. In some lines the specifications of consumers of foreign material vary within such wide limits, both as regards requirements for an identical article and for large numbers of different goods, that it is practically impossible to choose even a leader. But a heavy business is done in such articles as rail blooms, nail slabs, wire billets, wire rods, common Bessemer pig, &c., which admit of simple quotations. The importance of following the market in these articles cannot be underrated, especially at times when the competition of sellers of foreign material is exercising a strong or even commanding influence upon the great domestic industry. The prices made for foreign materials have again and again marked the line beyond which sellers of domestic products could not go. We have insisted repeatedly that

at equal prices the latter are generally given the preference, because of the convenience of close and easy communication between buyer and seller, and the greater probability that the former will get just what he wants without annoying negotiations through third parties. Absolute parity is not therefore the rule in all cases, and this buyers should, and generally do, thoroughly understand. It would be neglecting an important duty to the American iron and steel trades to fail to keep as close a watch as possible upon the movements in the market for foreign materials, and it is from this standpoint that we have viewed the dealings in the past year. Since the Germans have come more prominently into the world's markets competition has grown keener, and the probabilities of great and sudden rises have become less. We must moderate our pace to that of others if we do not wish to suffer keenly in the future for undue haste.

The St. Louis League and Organized Labor.

A correspondent sends us the following for discussion in our columns:

I have read with interest your comments on the circular issued by the Law and Order League in St. Louis, and concur in your opinion that the declarations contained therein "are such as any law-abiding, self-respecting citizen can heartily subscribe to." But I cannot so heartily endorse your statements in regard to organized labor, nor your opinion as to the probable results of efforts on the part of the St. Louis League—or any other—to suppress it. I have been a careful reader of much that has been written on this subject, and not an indifferent observer of the events that have been passing for some years past, and must say I have not yet seen where much good has resulted from labor, trade or professional unions in this country; on the contrary, much that is evil, or to put it in a little different way, it seems to me the evils resulting from all such organizations have greatly overbalanced the benefits flowing from them; nor have I been able to see, with human nature as it is, how it can ever be otherwise. It is a subject of vast importance. I am an earnest seeker after truth, and, for one, will be greatly obliged to you if you would point out the benefits and advantages, not only to the laboring classes (so-called), but to the mercantile, farming, mechanical and professional classes, arising from organized efforts to regulate labor, trade and prices.

To have suggested such comment the article to which reference is made must have been misunderstood. We advised the members of the St. Louis Law and Order League not to antagonize organized labor, and we think the advice good. The working classes are working out, through organization, a great and interesting social experiment. It is true that the objects to be attained are somewhat vague and indefinite, and that the experiment may end in disappointment. Such, however, is not the expectation of the wage-earning classes. They believe that through organization some form of good will be attained, and that society will be sooner or later reorganized on a more equitable basis. To some extent we agree with this view. Labor is more respected with organization than without it, and its interests are better protected by united action than they would be in all cases by individual action. There is no reason why the organization of labor is in itself considered a disorderly or illegal proceeding. If to accomplish results not otherwise attainable workingmen resort in the name of organized labor to acts of lawlessness or violence, the welfare of society demands that such acts be punished and their perpetrators suppressed. This we conceive to be in part the function of the St. Louis Law and Order League. But we must remember that organized labor is not responsible in all cases for the wrongs committed in its name. Appalling crimes have been committed in the holy name of religion, and liberty has much to answer for. Fanatics and violent, undisciplined followers of every great movement are more or less at war with society, and it is not surprising that the organization of labor has incidentally set dangerous forces in motion.

If the St. Louis or any other league should make the mistake of antagonizing organized labor because the public interest demands protection against the excesses committed in its name, it would precipitate a conflict of classes with far-reaching and disastrous results. Workingmen would resent any attempts to break up their organizations. Having faith in the experiment of changing the basis of social organization by peaceful means, they demand to be permitted to work it out to an issue. If this right is respected, honest, industrious and law-abiding wage-earners will aid in suppressing the dangerous elements in their own ranks. If it is denied they will feel that self-preservation impels them to take an attitude of resistance to the aggressions of the more fortunate classes, whose league is as much a union as if composed of carpenters or molders.

In this discussion we may waive the question whether any advantages have resulted from the organization of labor. The Democrat might question whether any net benefit had resulted from the existence of the Republican party, and the Republican ask the same question respecting the Democratic. Time will tell what the results of the labor experiment have been; no one can now predict them. Certain it is that only evil will result from attempts on the part of one class to suppress union and co-operation in another, and for practical as well as economic reasons the St. Louis and similar leagues would do well to heed our advice and not antagonize so much of the labor movement as represents an orderly and

peaceful effort to better the condition of the wage-earning classes. They cannot do it if they try, and an attempt will cripple their efforts to do the work which properly belongs to them.

Southern Steel.

Mr. E. C. Pechin, who is connected in an editorial capacity with the *Cleveland Iron Trade Review*, has addressed an open letter to G. B. West, of Birmingham, Ala., asking him a number of questions on points bearing upon the proposed manufacture of Bessemer steel in the South. Mr. West has asserted that Bessemer pig could be made in the Birmingham district for \$10, and pronounced this to be better by \$8 to \$9 "over any other manufacturing district in the Union." In contradiction of this statement Mr. Pechin puts forward the following as the cost of making Bessemer iron at Lake Erie ports:

100 units of iron at 8.5 cents per unit.	\$8.50
1 ton of coke	3.50
1½ ton of limestone at 80 cents	1.20
Labor per ton	1.08
Total	\$13.48
Renewals50
Incidental35
Total cost	\$14.33

Mr. Pechin adds that the figures for Chicago "will not vary much." We may add that similarly low figures might be quoted for the cost of some grades of pig iron manufactured in Eastern Pennsylvania, largely used in making Bessemer steel, and that in the Pittsburgh district certain producers probably can come fairly close to them. But it should not be forgotten that these costs relate only to that part of the iron which is made and used by the same parties. The pig produced by outside furnaces is costing considerably more, both East and West, and it, does not by any means follow that the average of the stock converted at any of the Bessemer works of the United States is as low in cost as the figure named by Mr. Pechin. Since publicity has been given to it, it is necessary to state this in order to remove the danger that it may be used perversely by writers hostile to American industry. We may take this occasion to again protest against a repetition in the case of steel of the folly, on the part of Southern writers, committed in the past when speaking of pig iron. We have ceased to hear much of \$9 and \$10 iron, and yet we know that with their much-improved practice Southern furnacemen are much nearer to it than they ever were in the times when doubting was criminal. There is now ample room for a great steel industry in the South, but Southern men should not forget that their markets are the very ones most readily invaded by foreign producers. Boasting, even if the facts sustain it, is dangerous. It is suicidal and worse than foolish when it is not backed by substantial advantages. There is now going the rounds of the press a paragraph which clearly illustrates to what lengths business men will go when infected by inventors. We are gravely told that steel can be made at the usual cost of pig iron, because the phosphorus contents of the cinder made in the basic process are worth as much as a fertilizer as it costs to convert the phosphoric pig iron into steel. One account figures the value of the slag from a ton of iron at \$3.40, while the cost of conversion is \$8. This is figuring the market price of the basic slag at the rate of \$26.88 per gross ton. Now, thus far the German works have been glad to get rid of the slag for nothing, though latterly one of the largest has made a contract which gives them a small return on the slag. It must be remembered, too, that this slag must be carefully ground before being available as a fertilizer, and we question therefore whether anybody will be found to pay even \$5 a ton for the crude material. This is a little help, but it does not even cover the excess of cost of the basic over the acid process. Any one who enters the steel business with such ideas will soon find the slag pile his most valuable asset.

One of our English contemporaries points with special satisfaction to the step recently taken by the Manchester (England) Steam Users' Association, by which any member, when intending to order a boiler, may consult the association, and, in return for a small annual fee, receive their advice and other aid. What this amounts to can be thus briefly outlined. The preliminaries as to power and pressure having been settled, the association will draw up a specification entering much more fully into details than the brief documents furnished by boiler-makers, and will supply, moreover, a code of constructive regulations for the guidance of the boiler-maker, and also a printed form of tender. These can then be sent to as many boiler-makers as it may be desired to obtain estimates, and there would be no difficulty in settling to whom to give the order, provided that only such firms in whom the prospective purchaser has confidence are asked to tender. The association, further, will take in hand the testing of the boiler material, including plates and all fittings; will superintend the mounting, arrangement of setting—in short, will be responsible for the excellence of the plant as a whole as called for by the specifications, and will finally grant the owner a pecuniary guarantee of its safety. There can be little question as to the valuable nature of the results of this enterprise if the work laid out be conscientiously done. The re-

responsibility for boiler accidents always has been and is now in many instances shared by both owners and builders, the former, aside from indulging in careless management, often demanding a boiler at a price much too low to be consistent with safety, and the latter furnishing one fully as bad as the user, perhaps unwittingly, asks for, and frequently one much worse. If this can be entirely done away with an important point will have been gained. In this country, we believe, the well-known Hartford Steam Boiler Inspection and Insurance Company, in addition to its regular work of inspecting and insuring boilers, is prepared to render services similar to those offered by the Manchester association, though on a slightly different basis. The clients here are not, as seems to be the case in the English enterprise, members of the company, but the latter acts in the ordinary capacity of consulting engineer, its wide experience, however, in the particular field of boilers, entitling its opinions to special consideration. We need not point out the good work which has already been accomplished in this way. The merits of the scheme are obvious, and English boiler owners will have every reason to congratulate themselves upon the acquisition of such an institution.

Mr. Frederick Siemens' paper on "Combustion with Special Reference to Practical Requirements," presented at the recent meeting of the British Iron and Steel Institute, suggests a number of things which in the ordinary processes of coal burning are generally overlooked. Particularly true is this of nearly all methods of boiler firing, and steam users specially will therefore find in the paper matter of interest and great practical value. After entering in detail on the manner in which the gases should be brought together to insure perfect combustion, and pointing out the necessity of avoiding a too intimate mixture producing a short flame having great heating, but little radiating, power, and an imperfect mixture which does not admit of proper combination, Mr. Siemens lays special stress upon the fact that neither the employment of gases in proper proportion nor their proper mixture is sufficient to insure perfect combustion "if the disturbing influence of surfaces is allowed to interfere to prevent combustion or to disintegrate particles of gas already combined." He points out further and more specifically that the influence of surfaces in general, and especially of highly heated surfaces, has been entirely overlooked. Heat, as we know, expands the molecules of gases and thus tends to weaken the chemical affinity of their atoms, until, at a certain high temperature, expansion overpowers chemical attraction, and dissociation takes place. But if highly heated surfaces are present, which tend to attract or condense one or the other of the elements constituting the gas experimented upon, dissociation is facilitated and will necessarily occur at a much lower temperature. It should not be difficult to gain from all this some idea of the nature of the losses which are constantly experienced in boiler furnaces, among others, but whose importance is not as fully recognized as it ought to be. That they should exercise a most marked influence on the proportions of different parts of boiler settings and on some forms of boiler construction is a matter of very little question, and experimental investigations would prove not only interesting, but of service in bringing about possible and much to be desired reforms.

At no time that we can remember has so much attention been given to the subject of heavy guns and their manufacture as at present. With the first serious gun explosion recorded on a British vessel, several years ago, something more than ordinary interest began to be manifested in the matter, and continued, though without special outward demonstration, until within a comparatively short time ago, when a sudden increase in the number of failures of heavy guns of British manufacture, and the unexpected results of a series of Government experiments on the effects of obstructions in gun barrels, combined to bring matters to a crisis. Since the bursting of the Collingwood gun, which is still fresh in everybody's memory, development has been rapid, and new and interesting features have followed one another in quick succession. The report of the investigating committee appointed by the British Government has removed all doubt, if indeed there ever existed any, as to the true nature of this accident, and the opinion expressed by them that the material of the gun was bad, its treatment worse, the construction faulty, and the method of testing uncertain, has been generally sustained by the available facts. It is not surprising that the condition which the report portrays so truthfully has caused no end of comment and indignant criticism, and the British Government will not be the only one to profit by the results. Gun designs are yet far from a state of perfection, and, in addition, their execution in some cases has been shown to be conducted with so much indifference that the effect of a general overhauling, such as the Collingwood disaster promises to entail, will be highly beneficial. In the light of recent experience, both theory and practice of gun construction appear capable of advantageously bearing revision, more or less, and

those who are not hampered by some of the existing designs have every reason to indulge in a feeling of satisfaction.

Opportunities for Investment in Russian Industrial Enterprises.

To the Editor of The Iron Age: The great Russian Empire seems to offer a field for operation worthy the attraction of American capitalists. Her vast resources in almost every direction are awaiting the skill and capital of foreigners to be developed. Russia's wealth in petroleum, rich ores, valuable minerals, coal, timber, grain, &c., have surprised many a stranger traveling through her domains, but what far more astonishes them is the incapacity of the natives, whether rich or poor, to take advantage of the country's natural resources. Where they have attempted it, as in the case of the petroleum fields, foreigners have almost monopolized everything. The country benefits indirectly by the influx of capital and the establishment of enterprises carried on by powerful corporations; but a Russian capitalist will never handle anything his great grandfather did not know all about, unless the Government will back the undertaking by guaranteeing dividends. The consequence of this liberality of the Government has been in nine cases out of ten that the enterprises proved to be a losing operation through loose management and dishonesty. Hence the reluctance of the Government to assist new schemes under native control with cash or guarantees. However, to the enterprising capitalist the Russian Central, State and city Governments seem to offer enough inducements in the shape of valuable franchises to invite investigation, and there are at present, as we understand, schemes looking for the needed capital in our markets under very favorable auspices.

The question of illuminating Russian cities with gas has long puzzled the city fathers of many a Russian town. Native gas coal is too remote from points of consumption, and the English coal is too expensive to take to interior towns; but a good supply of bituminous coal is accessible, and is offered at comparatively low prices. This is the native fuel, and, in connection with cheap crude oil or water gas of 10-candle power, can be manufactured at highly remunerative rates. St. Petersburg, with 1,000,000 inhabitants, is an inviting field in such an enterprise if it is considered that thus far only one-eighth part of the city has gas, the remainder being illuminated with petroleum and naphtha. The St. Petersburg Gas Company pay from 33 to 39 per cent. dividends annually, and a syndicate of St. Petersburg bankers intend to reorganize the existing company on a larger footing, to enlarge the works and extend the pipe system. St. Petersburg gas is made from Newcastle coal.

Another valuable franchise is offered by one of the rich interior towns which has no gas at all. Besides the above cash order for a plant is awaiting execution, to furnish light and fuel gas for an imperial private glass and porcelain works. And still another scheme consists of the desirable exploitation of an immense iron mine 150 miles from St. Petersburg, with ready cash market for pig iron and steel, the ores being of the famous Swedish type. This is a surface mine for years to come, as the tract of land covered by it is 160 square miles in extent, while the wood for charcoal is free and close to hand. The manufacture of pig iron would, it is claimed, bring 25 per cent. net profit, while steel would be even more profitable. The importations of pig iron at St. Petersburg amounted to 84,099 tons in 1882, 86,907 in 1883 and 124,243 in 1884. The Siberian mines produce an average of 66,000 tons of ore.

The best proof of the indolence of Russian owners of mines, all of which belong to great estates, is the fact that the first prospecting drills ever bought for Russia were shipped to the Ural Mountains, which are full of gold, in April of this year. The bulk of the supply of gold is obtained from Siberian placer diggings. Mines as rich as the best American mines, with labor at one-quarter of American and no competition to speak of, are certainly worth the attention of American capitalists. Only the small amount of general information about Russia seems to have prevented him from going into enterprises where English capitalists have drawn millions.

O. W. MADDANS.

33 SOUTH WILLIAM STREET.

The following very sensational story has been telegraphed to and been printed by the New York Herald: "A man named John T. Jones, who was generally supposed to be a tramp, and who dressed like one, appeared here two months ago, and after working for a while about different mines offered 25 cents a ton for a pile of refuse rock at the Winthrop Hematite Company's mines, the money to be paid as the rock was removed. Jones said he thought he could make a little something off the rock. The company were surprised one day when Jones set a force of men at work sorting the rock and carting off the ore. Jones also bought other piles of rock at the same figures. It now transpires that the rock pans out one-half good ore, for which Jones received \$5.50 a ton. The Winthrop pile alone contained 500,000 tons of rock, and netted Jones over \$1,000,000. Other piles have netted him about \$4,000,000. The work has been conducted under the very eyes of the mill owners, who have regarded the rock piles as worthless and paid no attention to Jones. Within a few days the fact has leaked out that the Jones ore has been shipped largely to Joliet, Ill. The news came back from that point and has created a great sensation." Just how this wonderful Jones has been able to put on the market in two months enough ore to net the ridiculous sums mentioned is a mystery. The dispatch is a typical one in many respects of the condensed misinformation on matters relating to the iron and steel trades of which the daily press is too often guilty.

Natural gas was burned into the steel-rolling mill of the Columbia Company, at Johnstown, on Thursday, in the presence of President Townsend and others interested. The gas

will be turned on in the other departments of the mill gradually from day to day till November 1, when it will be in general use. A stand-pipe 45 feet in height is used to allow the surplus gas to escape. A pressure of 100 pounds was obtained nearly 40 miles from the initial point. As soon as the possibilities of the new line are in some measure ascertained connection will be made with all of the towns intermediate between Johnstown and Grapeville. The line thus completed was begun early in the summer, and is of 12, 16 and 20 inch pipes, the smaller diameters lying nearest to the wells. The cost of its construction will reach nearly \$1,000,000.

Experts on the Witness Stand.

To the Editor of The Iron Age: I noticed in The Iron Age of a recent date an article on the subject of "Experts on the Witness Stand." The writer complained of being placed on the stand as a witness, or, to put it in the light in which he viewed the matter, I might say as a target for lawyers to shoot at. It is not necessary for me to say that it is a very unpleasant situation to be placed in; but I must say that if we look over some of the most important and noted cases in which there have been employed as witnesses experts who would flatly contradict each other's statement, be it in chemistry, engineering or any other line, we can hardly find grounds for condemning the lawyers for their seemingly impertinent cross examinations. It would naturally suggest itself that in such cases the experts should settle the points at issue between themselves, permitting an intelligent discussion of the subject. If the point so argued cannot be settled by experts, how can they expect it to be settled in a public trial by lawyers, some of whom may be entirely at sea so far as knowledge of the matter is concerned. It would seem from general observation that the less the lawyer knew of the particular branch of mechanics or science under discussion the more ridiculous he would make the witness appear in the eyes of the spectators and general public. This becomes more prominent as the testimony of experts varies, and their situations are made embarrassing by their own testimony.

Since reading the above-mentioned article in your paper it has many times come to my mind very forcibly that there is room for a large amount of good, healthy discussion on this subject, profitable both to the expert and to the lawyer. In looking over some notes that were called to my mind from the above I find the following: Some few years since the writer was called to look over a large manufacturing plant where there was a dissatisfied feeling in regard to the power as regards coal consumption. I found after some inquiry that an expert had been employed, and so far as I could learn there had been taken out an engine that was running with a load calling for a mean effective pressure of about 40 pounds. In its place was put a larger engine that did the work (figured from indicator cards taken in my presence) with the expansion line passing below the atmosphere very early in the stroke, and that when running non-condensing, but with this large engine was put in a condenser that added to the already poor economy. From a statement given by the engineers in this trial of the engine the fact was brought out, in confirmation of the generally accepted idea, that they burned more coal with the condenser on than without it. They were not long in deciding to leave the condenser off entirely, and their faith in experts was made very shadowy, I assure you. One more illustration and I will have finished. I find in my scrapbook an old slip of paper from which I quote in part only. The unknown writer of this article was discussing this matter under the head of "economy of light loads," but it comes in under the above heading very appropriately. After going over the ground of light loads he refers to the following instance: A certain firm had purchased an engine of 80 horse-power to do the work of 25 horse-power, under the supposition that they would get satisfactory results, but when the consumption of coal was brought to their notice they discovered their mistake. They were advised by the above writer to replace the 80 horse-power with a 25 horse-power, which was done. The result is given here. With the large engine 1600 pounds of coal and with the small engine 750 pounds did the same work, and this with precisely parallel conditions. Is it not altogether probable that the users in purchasing the large engine were acting under the advice of a so-called expert engineer? And is it not altogether proper that experts should be handled in the same manner in the witness chair as others with less pretentious titles?

H. S. BROWN.

The Cable Road Company exhibit a new apparatus for operating cable roads by means of compressed air. The machinery is so arranged that by one and the same movement the gripman can let go of the cable, put on a brake, blow the steam signal, turn a switch, and pick the cable up again. He can also use the track grabber, which allows the car to be held and stopped, even in the case of an accident to both brake and cable. The machinery is all directly under the car, the motor being some distance in front of the cylinder for the compressed air. The "jaws" are made of glass, thus doing away with all friction and preventing the wearing out of both cables and machinery.

A house of straw is being constructed in Philadelphia, to be shipped to England and erected in the grounds of the American Exhibition in London. It is an American suburban villa 2½ stories high and covering a space of 42 x 50 feet. It will be composed entirely of material manufactured from straw, the timbers, lumber, sheathing, flooring and decorations being of that material, and the inside finish executed in imitation of different woods.

A document relating to American wool, prepared after six years' investigation, claims for it a superiority which has never before been fully recognized.

Recent Treasury Decisions.

The Secretary of the Treasury has rendered the following decisions relating to the metal schedule of the tariff:

IRON BANDS NOT RETURNABLE AS SCRAP.

In reply to a request for free entry of iron bands claimed to be of domestic manufacture, exported and returned, the Secretary declines on the ground that the bands were exported as protections for bales of cotton exported from the United States, and that on arrival of the cotton at the foreign port they were cut from the bales and are now returned in the condition of old scrap iron. The articles, although originally of domestic manufacture, are not returned to the United States in the condition in which they were exported, and consequently the application cannot be granted. The free list only exempts domestic manufactures from the payment of duty "when returned in the same condition as exported."

DUTY ON EDGE TOOLS.

In a claim for 2½ cents per pound instead of 45 per cent. ad valorem on certain so-called "forgings of iron and steel" the department in rejecting the claim ruled that the articles in question, which are commercially known as "edge tools," consist of cast-steel firmer chisels, firmer gouges, turning chisels, turning gouges, cast-steel long thin paving chisels, paving gouges, cast-steel single plane irons, cut plane irons, double plane irons and both irons, and are composed wholly of iron and steel; that they are manufactured by a first process of forging or hammering to the shape or form required for their further manufacture, being then welded with steel for cutting purposes, and are afterward submitted to the further process of grinding and polishing, and are now ready for sharpening to fit them for immediate use; that they are in a finished condition as "manufactures of steel and iron," and are not in that condition known as "forgings of iron and steel."

THE DUTY ON STRUCTURAL IRON.

A reconsideration of department decision sustaining the assessing of duty of 1¼ cents per pound on certain structural iron having been granted, the appellants claiming duty at 45 per cent. as an entirety, Acting Attorney General Jenks thus concludes his opinion:

In its broadest sense a manufacture includes whatever is made by the hand of man or by machinery subject to his hand. In this sense edifices, buildings, railroads and structures of all kinds would be comprehended. The rule was not intended to be used by the Legislature in this broad sense. It is used in the general clause at the conclusion of a schedule in which enumeration and specification was the plan. Only such works of man as were too unimportant to warrant specification, or such as were so uncommon as to escape the attention of the Legislature, were intended to be embraced by it. The iron floor frames in the United States would be neither unimportant nor unusual. In the magnitude of their value or frequency of use, nothing enumerated in the bill would have been more conspicuous, or, if they were to be dutiable as an entirety, would be less likely to be omitted in the enumeration. The inference is strong that they were not intended to be charged as an entirety. At the time of importation they were not an entirety. What merchandise is at the time of importation is what classifies it for duty, not what it has been before or what it may be in the future. The girders, beams, &c., in this case were not a floor frame; they were only the prepared material for a floor frame. Until actually put together at their final destination the material was not a frame. When so put together it would be a structure, and not a manufacture. It would be in reality such as is not appropriately the subject of the customs laws. If all the rails, frogs, fish plates, &c., that constitute the material for a railroad track were fully finished for laying in a foreign country it would not justify their admission as a railroad track under this clause, yet such an importation would be as much an entirety as this, and as properly a manufacture. It is an unnatural stress on language to call the iron frame of a large Statehouse or the track of a railroad a manufacture in a customs law, and I am constrained to believe the Legislature did not so intend. Besides, this general clause to Schedule C was only to apply to manufactures "not specially enumerated or provided for in this act." Iron "girders, beams, nuts, bolts, with all other structural shapes of iron," are enumerated and specially provided for. "Structural iron" is naturally interpreted to mean iron adapted to and prepared for use in a building. The importation in this case would seem to be just such material and therefore specified and enumerated. Hence it is concluded that the importation in this case should not be classified as an entirety as a manufacture, but its several parts should be classified under such several specific provisions of the act as are applicable to each class of merchandise in the entry.

The editor of the Rio News discourses upon the importance of extending commercial relations between Brazil and the United States. No judicious effort should be spared to strengthen the ties between the two countries, but a subsidized steam line is not considered a prime requisite. A partially subsidized service for several years results in but "a slight increase in the aggregate imports from the United States, which represents manufactured goods, while the exports to that country, which are not affected by this steamship line, have been largely increased. The trade balance against the United States has therefore been increasing instead of diminishing." The writer further remarks that "here in Brazil, as in every other foreign country, the merchants and manufacturers of the United States are compelled to meet the open competition of all other countries, and their chance of success is through the excellence and cheapness of their goods and the means employed to place them upon the market. As long as it costs more to manufacture goods in the United States than in Great Britain, France

and Germany, just so long will that country occupy a position of disadvantage in the consuming markets of the world." Not only this, but to insure success it is needful that American merchants should be seen in the foreign market, giving direction to trade which is often influenced by rivals to their prejudice. If the demands above indicated can be satisfied, the supplementary question of ocean transportation, we are told, would be of easy solution.

Obituary.

We are pained to announce the death of Mr. David C. Bradley, at his residence in Chicago, on Monday morning, the 25th inst., in his 48th year. Mr. Bradley had been in failing health during the last two years, but it was only in the past six months that serious symptoms appeared. During the past two months he frequently had to suspend active business for a day or two at a time from sickness, which continued to increase until three weeks ago he was entirely confined to his bed.

Mr. Bradley was born in Ireland in 1838, and removed to this country in company with his parents when quite young. Not being able to trace his boyhood career, we first find him as an apprentice in the hardware and iron store of Bottsford & Co., on Lake street, Chicago, at the age of 18. After occupying several clerical positions he decided to enlist in the army, and at the age of 23 he was mustered into the service of the 56th Illinois regiment as lieutenant, being subsequently promoted to adjutant general, serving on the staff of General Cox as aide-de-camp. He remained in the service until near the close of the war, after which he returned to Chicago and entered into co-partnership with Mr. C. D. Rhodes in the coal business in the spring of 1867, continuing this business for a year and a half, when they became sales agents for several pig-iron furnaces. He was one of the organizers of the rolling mill company at Cummings, which was run for some three months under the name of Rhodes, Bradley & Co., and subsequently changed to the Calumet Iron and Steel Company, of which he was elected vice-president and general manager. This position he held until last spring. About the same time that the Calumet Company was first organized the Bangor Furnace Company was also put into operation, and he acted as one of the directors and manager of that in conjunction with his other duties. When he severed his connection with the Iron and Steel Company last spring he became chairman and general manager of the Bangor Furnace, which was then owned and controlled by Bradley, Graves & Co., to which he devoted his entire attention up to the time of his death. He was a man of marked business integrity, noted for his honorable purpose and square dealing in all transactions. Through his short business career he had made many friends in the trade, and had become widely known as one of the prominent pig-iron men of the West.

A Russian Torpedo-Boat.

The Wiborg torpedo-boat, built for the Russian Government by the English builders, Messrs. Thompson, of Clydebank, recently completed a series of experimental trials. The vessel is so lightly and delicately constructed that the Russian Admiralty specified a very much larger number of experimental trials than is usual in this class of vessel. A series of trials has been carried out, about 12 in number, to determine the best form of propeller for the vessel. In addition to these trials a series of experiments has been made out to determine the maneuvering capabilities of the vessel, another series testing her seagoing qualities, and a third series to determine the rate of consumption of fuel. In all the vessel has had nearly 20 trial trips. The Wiborg is 148 ft. long, 17 feet broad and 9½ feet deep. She carries two revolver Hotchkiss guns, and four torpedo tubes or guns. She can carry coal to steam 4500 knots at 10 knots per hour. Her machinery is duplicated, and, in fact, she is the first torpedo-boat built in this country with twin screws. Messrs. Thompson made this departure in face of the fact that the leading torpedo-boat builders had predicted that the adoption of twin screws meant a considerable loss of efficiency. The vessel is divided into 22 water-tight subdivisions. The engines and boilers are encircled by a belt of coal protection. The torpedo tubes forward are protected from machine-gun fire. The vessel is fitted with a bow and stern rudder. At a former trial the Wiborg attained a speed of 22 knots per hour. Since then she has been timed in a very much more deeply laden condition, such as would represent her in complete fighting trim, with coals on board for a long sea cruise, and she has maintained on three different days a speed of nearly 21 knots for four hours at each time together. The vessel turns a half-circle in a little over half a minute.

The Canadian Pacific Railway Company are supposed to be quietly perfecting their arrangements to connect with New York City direct from Montreal. The several links in the chain are not yet clear, but it is believed that the chief one is the old Lebanon Springs road, which was reorganized last year as the New York, Rutland and Montreal. The Central Vermont, the Bennington and Rutland and the old Lebanon Springs road would form the northern section of this new air line from the chief port of the St. Lawrence to New York. Only to miles of new road will have to be built—this is now in course of construction—to extend the Lebanon Springs to the State line between Massachusetts and New York State, where connection may be made with the Housatonic Railroad. The idea is to use this road to New York, and from New York to enter New York by the New York, New Haven and Hartford.

A tunnel 2000 feet long will be required on the proposed route for the New York and New England Railroad between Poughkeepsie and Lake Mahopac.

BUFFALO HEATING FORGES



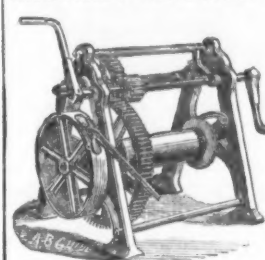
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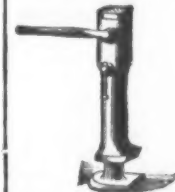
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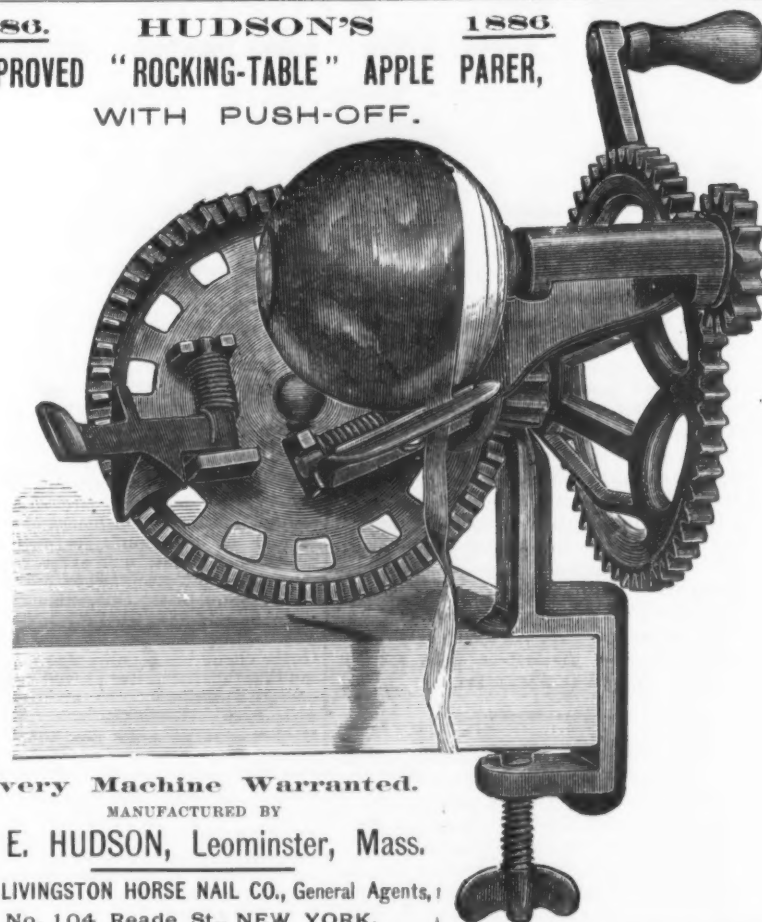
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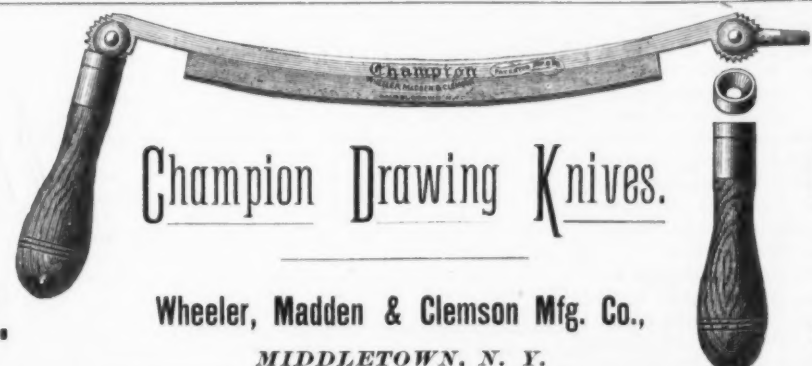


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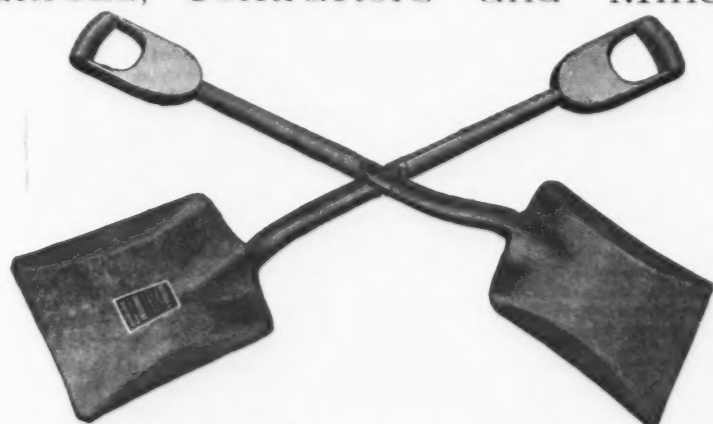
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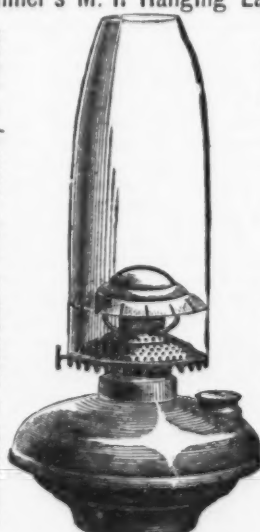
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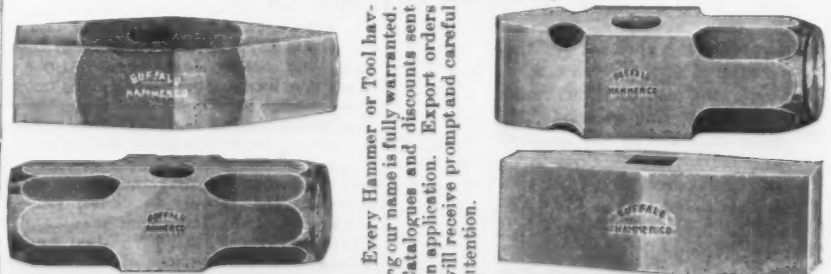
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Ward & Mfg. Co., Cleveland, O., 42

Pumps, Force.
Field Force Pump Co., Lockport, N. Y., 7
Myers E. & Bro., Ashland, I. O., 6
Parker Bros., 103 Chambers, N. Y., 7

Pumps, Machine.
Douglas W. & B., Middletown, Conn., 7
The Humphreys Pump Co., Mansfield, O., 7
Hunt & Deering Mfg. Co., Salem, O., 7

Pumping Machinery.
Dean Bros. Steam Pump Works, Indianapolis, Ind., 34

Punching and Shearing Presses.
Hartford Iron Works, Hartford, N. Y., 10
Heartley Geo. W., Toledo, O., 28
Stiles & Parker Press Co., Middletown, Conn., 10
Watson & Stillman, 204 E. 43d St., N. Y., 14

Rails, Iron and Steel.
Allentown Rolling Mills, Allentown, Pa., 5
Cambridge Iron Co., Johnstown, Pa., 5
Crawford Iron & Steel Co., Danville, Pa., 30
Scranton Steel Co., 56 Broadway, N. Y., 30

Railway and Machinists' Supplies.
N. Y. Supply Co., 96 & 92 John, N. Y., 13
Rohrer Brothers, 19 John, N. Y., 13

Railroad, Mill, and Mills' Supplies.
Halnes S. A., 90 Chambers, N. Y., 16
Greene, Tweed & Co., 83 Chambers, N. Y., 38

Rakes, Hand.
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Ratchet Drills.
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Refrigerators.
Heinz & Munschauer, Buffalo, N. Y., 10

Rivers.
Barnes & Johnson, Watervbury, Conn., 9
Grundy & Dowsay, 150 Greenwich, N. Y., 13
Old Colony River Co., Kingston, Mass., 2
Sawyer & Sons, 100 Chambers, N. Y., 13
Townsend W. P. & Co., Pittsburgh, Pa., 41

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Rock Breakers.
Mason & Co., Machine Co., Ansonia, Conn., 37

Rock Drills.
Clayton Jags, Brooklyn, N. Y., and New York City, 37

Rubber Goods.
Hartford Rubber Works, Hartford, Ct., 43

Rules, Manufacturers of.
Stanley Rule & Level Co., 29 Chambers, N. Y., 9

Sad Irons.
Enterprise Mfg. Co., Philadelphia, 38

Sap Spouts.
Post C. U., Burlington, Vt., 38

Sash Balances.
J. H. Smith & Co., Hartford, J. Conn., 30

Sash Cards and Chains.
Morton Thos., & Elizabeth, N. Y., 31
Smith & Page Mfg. Co., Bridgeport, 40
Talmage R. & Co., Boston, Mass., 37

Sash Locks.
Ireland Mfg. Co., Cincinnati, O., 37

Sash Pulleys.
Empire Portable Forge Co., Cohoes, N. Y., 31

Saw Sets.
Saw Set & Saw Set Co., Philadelphia, 9
Morrell-Chas., 40 College Place, N. Y., 31

Saws, Makers of.
Atkins R. C. & Co., Indianapolis, Ind., 32
Clark & Co., 75 Chambers, N. Y., 30

Scalers, Manufacturers of.
Arc Scale Co., Davenport, Iowa, 38
Buffalo Scale Co., Buffalo, N. Y., 31
Chattanooga Scale Co., Chattanooga, Tenn., 9
Kirby Irons, Philadelphia, 5
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Screens, Window and Door.
Porter & Co., New York, 11
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Screw Drivers.
Garrett Drill Co., Plantville, Conn., 10
Graham J. H. & Co., 113 Chambers, N. Y., 8
Standard Tool Co., Hartford, Conn., 30

Screws, Makers of.
Allen & Co., 17th and Venango Sts., Philadelphia, 13
Bruce Geo. W., 1 Platt, N. Y., 9
Forbes & Co., Pawtucket, R. I., 3
Miles F. S., 306 Quarry, Philadelphia, 3

Scroll Saws.
Seneca Falls Mfg. Co., Seneca Falls, N. Y., 44

Seythe Cutters.
Pike Mfg. Co., Pike Station, N. H., 10
Leland Stone Co., Cleveland, O., 31

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New London Seythe Co., 8

Shaving-Machines.
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Pierson & Co., 24 to 27 West, N. Y., 4
Sellers Win. & Co., Philadelphia, and 79 Liberty, N. Y., 3

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Shears and Scissors.
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Henry Seymour Cutlery Co., 84 Chambers, N. Y., 3
Silberhorn Wm. & Son, Conn., 38

Ship Chandlery.
Creed Geo. B., 103 Reade, N. Y., 10

Ship Chandlery Hardware.
Sheffield Brass Hardware Co., Birmingham, Ala., 34

Shovels, Spades and Scoops.
Bruce George W., 24 Duane, N. Y., 9
Hussey, Bliss & Co., Pittsburgh, Pa., 16

Show Cases.
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Shutter Workers.
Dodd Mfg. Co., 19 Park place, 39

Sinks.
Douglas W. & B., Middletown, Conn., 7
Burkhardt & Jacobs Mfg. Co., Columbus, 29

Silverware.
K. Wallace & Sons Mfg. Co., Wallingford, Conn., 1

Dishes.
Standard & Kendall, Boston, 10
Union Hardware Co., Torrington, Conn., 35

Smelting Furnaces.
Severns Paul S., 209 South Broad, Phila., 44

Snares.
Seymour Mfg. Co., St. Louis, Mo., 35

Speaking Tubes.
Stratner W. R., 113 Liberty, 21 & 23 Ann, N. Y., 10

Spring Balances.
Manning & Squier, 113 Liberty, N. Y., 2
Springs Spring Co., Worcester, Mass., 3
Salvin Machine Co., Montpelier, Vt., 42

Spring Hinges.
Hartford Iron Works, Hartford, N. Y., 7

Steam Hammer, &c., Makers of.
Diemel & Kuenhardt, Philadelphia, 42
Crosby & Bishop, 24 Adams, N. Y., 3

Steam Pumps, &c., Manufacturer.
A. S. Cameron Steam Pump Works, foot of Erie Canal, Buffalo, N. Y., 13
Cooge & Co., 22 Cortlandt, N. Y., 9
McCauley John H. & Co., Cincinnati, O., 42
Thompson & Sons, 24 Adams, N. Y., 3

Steel Figures and Alphabets.
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Steel Importers.
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Hobson Francis & Co., New York & Engle, 37
Hobson & Co., New York, Sheffield, Eng., 37
John N. S. Y., 37
Newton & Shipman, 82 John, N. Y., 36
Roberts & Co., New York & Engle, 37
Whitmer A. R. & Co., 17 Broadway, N. Y., 4

Steel Manufact's Special.
Hartford Iron Works, Hartford, Conn., 12

Steel Manufacturers.
Barrows Thos. C., 99-101 John, N. Y., 6
Brown & Co., 27 John, N. Y., 6
Burgess Steel and Iron Works, Portsmouth, O., 12
Chrome Steel Works, Hastings, E. D., 12
H. I. & E. Co., Pittsburgh, Pa., 36
Frankford Steel Co., Philadelphia, Pa., 6
Gauster Steel Co., Philadelphia, Pa., 36
Hartman Steel Co., Philadelphia, Pa., 36
Joseph Wm. & Sons, Sheffield, Eng., 36
Midvale Steel Co., Nicotown, Phila., 6
Miller Metcalf & Parkin, Pittsburgh, 36
Monroe & Co., Pittsburg, Pa., 36
Moore F., 83 John, N. Y., 36
Naylor & Co., 90 John, N. Y., 36
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Steel Rolls.
Garrison A. & Co., Pittsburgh, Pa. 4
Kane, Smith & Black 36
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Standard Iron Co., Bridgeport, O. 36
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Carey & Moen, 234 W. 29th, N. Y. 3
Chicago John & Sons, 55 to 59 Cliff, N. Y. 9
Rowland & Harvey, New York, N. Y. 44
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Steel, Tool.
Jessel, Tool & Steel Co., Philadelphia, Pa. 6
John & Sons, Sheffield, Eng., 91 11
John & Sons, 4 Fletcher, N. Y. 44
Smith Bros. & Co., Pittsburg, Pa. 36
Sticks and Dies.
Butterfield & Co., Derby Line, Vt. 42
Hart Mfg. Co., Cleveland, O. 31
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Wiley & Russell Mfg. Co., Greenfield, 44
Stove Boards.
Shepard Shingle & Co., Buffalo, N. Y. 31
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Ostrander Jas. & Son, Troy, N. Y. 38
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Tuckerton Mfg. Co., Indianapolis, Ind. 31
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Tacks and Nail Machinery.
Merritt E. Co., Brockton, Mass. 10
Tack and Shoe Nail Machinery.
Sweetser W. A., Brockton, Mass. 8
Tacks and Staples.
Cold & Co., Plymouth, Mass. 13
Fluorance Tack & Staple, Mass. 13
Grundy & Shawlow, 10 Greenwich, N. Y. 13
Holtz Fleischer, Birmingham, N. Y. 32
Keith & Truitt, Campbell, Mass. 30
Larned S. H., Worcester, Mass. 30
Phillips E. & Sons, South Hanover, Mass. 13
Taps and Brads.
American Nail Co., Fairhaven, Mass. 8
Walkley Hdw. Co., Plantsville, Ct. 39
Tacks, Nails, &c.
Plymouth Mills, 32
Taps and Dies.
Butterfield & Co., Derby Line, Vt. 42
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Champion Blower and Forge Co., Lancaster, Pa. 24
Tire Calks, Steel.
Burke & Co., Philadelphia, Mass. 36
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Ives W. A. & Co., New Haven, Conn. 4
Tools.
Atkins E. & Co., Co., Indianapolis, Ind. 32
Tools, Steam and Gas Filters.
National Valve Works, Yonkers, N. Y. 41
Towel Holders.
Hall & Co., Hartford, Conn. 31
Tramson Lifters.
Lloyd & Lippie Hvy. Co., Philada. 24
Payson Mfg. Co., Chicago, Ill. 41
Reiber F. A. & Co., Chicago, Ill. 41
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Tricycles.
Earl Mfg. Co., Elyria, O. 8
Trucks, Manufacturers of.
Denning F., Waterbury, Conn. 34
Lansing Wheelbarrow Co., Lansing, 32
Penfield Block Co., Lockport, N. Y. 10
Richie Bros., 9th, above Market, Phila. 8
Truck Scrapers.
Frederick & Co., 419 Eighth, N. Y. 9
Tables, Seamless Drawn Copper.
Bridgeport Brass Co., 19 Murray, N. Y. 2
Tubs, Steel.
Long John S., 4 Fletcher, N. Y. 44
Turbuckles.
Frederick & Co., Forge and Iron Co., Cleveland, O. 34
Merrill Bros., 50 3d St., Brooklyn, E. D. 34
Twist Drills, Makers of.
Frederick & Co., 419 Eighth, N. Y. 9
Morse Twist Drill & Machine Co., New Bedford, Mass. 42
W. Y. Fletcher, N. Y. 42
Mass. 42
Type Writers.
Hammond Type Writer Co. 35
Upright Drills.
Frederick & Co., Worcester, Mass. 10
Merritt E. Co., Brockton, Mass. 10
Valves, Gas, Water and Steam.
Chapman Valve Mfg. Co., Boston, Mass. 8
Frederick & Co., 419 Eighth, N. Y. 9
Ludlow Valve Mfg. Co., Troy, N. Y. 42
Vises.
Howard Iron Works, Buffalo, N. Y. 41
Frederick & Co., 419 Eighth, N. Y. 9
Wardrobe Hooks.
The Wire Goods Co., Worcester, Mass. 35
Washing Machines.
Bangham N. C., York, Pa. 35
Weather Strips.
Counsell & Co., 15 Day, N. Y. 33
Wheelbarrows.
Dreyfus J. C. & Co., 29 Ross, New York. 30
Whetstones.
A. F. Pike Mfg. Co., Pike Station, N. H. 10
White Lead.
Frederick & Co., Mite Lead and Lined Oil Co., 287 Pearl, N. Y. 31
Jewett John & Sons, 182 Front, N. Y. 31
W. Y. Fletcher, N. Y. 42
Window Fasteners.
Clancy J. R., Syracuse, N. Y. 20
Window Screens.
Paine, Diehl & Co., Philadelphia, Pa. 30
Wire and Ironwork.
E. J. 3
Wire, Manufacturers of.
Gautier Steel Department of Cambria Iron Co., Johnstown, Pa. 2
Hartman Steel Co., Pittsburgh, Pa. 9
Howard & Morse, 45 Fulton, N. Y. 2
W. Y. Fletcher, N. Y. 42
Prestantire W. & Co., Holyoke, Mass. 2
Salem Wire Mfg. Co., Salem, O. 32
Trenton Iron Co., Trenton, N. J. 32
Worcester & Morse Mfg. Co., Worcester, Mass. 2
Wire Cloth.
Howard & Morse, 45 Fulton, N. Y. 2
Wickwire Bros., Cortland, N. Y. 2
Wire Fences.
Howard & Morse, 45 Fulton, N. Y. 2
Wickwire Bros., Cortland, N. Y. 2
Wire Ropes.
Hess M. L., Chester, Conn. 3
Gilbert & Bennett Mfg. Co., 82 Cliff, N. Y. 3
Hollow Cable Mfg. Co., Brooklyn, N. Y. 2
Howard & Morse, 45 Fulton, N. Y. 2
J. Jencks & Co., Pawtucket, R. I. 4
Ludlow Sagor Wire Co., Detroit, 32
The Wire Goods Co., Worcester, Mass. 2
Wickwire Bros., Cortland, N. Y. 2
Wire Machinery.
Frederick & Co., New Haven, Conn. 41
Wire Nail and Tack Machines.
Birmingham Iron Foundry, Birmingham, Conn. 3
Whitney A. R. & Co., 18 Exchange Place, N. Y. 41
Whitney A. R. & Co., 17 Broadway, N. Y. 46
Wire Nails.
American Tack Co., Fairhaven, Mass. 8
H. P. & Co., Cleveland 38
A. Field & Sons, Taunton, Mass. 10
Hartman Steel Co., Pittsburgh, Pa. 9
Holtz Fleischer, Campbell, Mass. 30
Phillips E. & Sons, South Hanover, Mass. 13
Plymouth Mills, Plymouth, Mass. 32
National Valve Works, Yonkers, N. Y. 41
The Wire Goods Co., Worcester, Mass. 2
Whitney A. R. & Co., 18 Hudson, N. Y. 4
Wire Rops, Steel.
Bendler & Co., Pittsburgh, Pa. 2
Wire Rope, Iron and Steel, Makers.
Broderick & Hanson, St. Louis, Mo. 2
A. Leschen & Sons Rope Co., St. Louis, Mo. 2
National Valve Works, Yonkers, N. Y. 41
Mass. 2
Wood Engravers and Electrotypers.
Mugger & Co., Hartford, Conn. 16
Woodenware.
United Woodenware Works, Indianapolis, Ind. 32
Wood-Working Machinery.
The Eagle Co., Cincinnati, Ohio. 10
Wrenches.
Hess M. L., Call Hardware & Tool Co., Springfield, 10
Cox A. B. & Co., Worcester, Mass. 21
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Wringers.
Lovel Mfg. Co., Limited, Erie, Pa. 37
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Trade Report.

New York.

American Pig.—The New York market for Pig Iron is quiet, but strong. With the exception of a few sales of round blocks of Southern Foundry Irons for delivery during the first three or four months of 1887, under special circumstances, business is confined to jobbing transactions. On this class of trade higher figures are demanded and frequently conceded, though not without grumbling, the smaller buyers insisting that they are not getting any more for their manufactures, so that the advance comes out of their slender profits. We quote standard brands No. 1 quality, \$18.50 @ \$19; No. 2, \$17.50 @ \$17.75 and Gray Forge, \$16 @ \$16.50.

Scotch Pig.—The advance abroad continues, one of the reasons for it being an accident at the Gartsherrie Works by which eight furnaces have been threatened with idleness. So far as this market is concerned any advance means simply the cutting down of business to the narrowest limits, and the only significance the upward tendency abroad has is to make higher quotations of Domestic Iron possible without interference by the Foreign Pig. We quote as follows for moderate-sized lots: Coltness, \$21.75 @ \$22 to arrive; Gartsherrie, \$20.75 @ \$21; Shotts and Langloan, \$20.75 @ \$21; Carnbroe and Glengarnock, \$19.50 @ \$20; Summerlee, \$21; Dalmellington, \$19.75 @ \$20; Eglington, \$19 @ \$19.50, and Clyde, \$19.50 @ \$20.

Bessemer Pig.—The market has been quiet, the only feature being the further advance in Foreign quotations, which put that class of Pig out of this market, at least until Domestic has followed suit. The latter is stiffer. We quote \$18.25 @ \$18.50 at furnace.

Spiegel Eisen.—Outside of a lot of 1200 tons Domestic 20% for 1887 delivery at \$26.50 at furnace, there have been some sales of small lots of Foreign, and there are inquiries in the market. Sellers ask \$26.50 @ \$26.75 for 20% English, with buyers at about \$26.25.

Foreign Ore.—There is considerable inquiry, but importers are holding off because of higher freights.

Bar Iron.—The market is still active and firm, with many of the mills supplied with orders for the balance of the year. Buyers, having for a long time carried practically no stocks, are very urgent in demanding deliveries. We continue to quote Common Iron 1.65¢ @ 1.70¢; Medium, 1.70¢ @ 1.75¢; and Refined, 1.85¢ @ 1.95¢.

Structural Iron and Steel.—There has been considerable activity and much pressure for prompt delivery. The bridge works are very busy, and there are a number of orders in the market for export. We quote, according to quality, for Angles 2.15¢ @ 2.30¢, delivered, and Tees at 2.5¢ @ 2.6¢, for round lots. Steel Angles are quoted 2.40¢ @ 2.50¢, according to quality. Store quotations remain 2.45¢ @ 2.50¢ for Angles, and 2.75¢ @ 2.8¢ for Tees. American Beams and Channels are nominally 3¢ base from dock for all orders.

Merchant Steel.—We quote nominally for the range of ordinary to good grades as follows: American Tool Steels, 7½¢ @ 9¢; Tool Steel of special grades and finer qualities, 12¢ @ 20¢; English Tool, 13¢ @ 15½¢; common grades, 7¢ @ 9¢; Crucible Machinery, 3.75¢ @ 4.50¢. The Steel Association quote base prices: Round and Flat Spring, 2.6¢; Round-Edge Tire, 2.3¢; Square-Edge Tire, 2.5¢; Toe Calk, 2.4¢; Sleigh Shoe, 2.2¢ @ 2.5¢; Open-Hearth Machinery, 2.5¢, and Bessemer Machinery, 2.5¢.

Plates.—A number of round orders have been placed, and the market continues strong and active. We quote for round lots: Common or Tank, 2.25¢ @ 2.35¢; Refined, 2.35¢ @ 2.40¢; Shell, 2.5¢ @ 2.6¢; Flange, 3.40¢ @ 3½¢; Flange, Extra, 4¢ @ 4½¢. For small lots of Steel Plates the quotations are as follows: Tank, 2.70¢ @ 2.75¢; Ship, 3¢; Shell, 3¼¢; Flange, 3½¢, and Fire-Box, 4¼¢ @ 4½¢, on dock.

Steel Billets.—Considerable business has been done during the week, and quotations have been advancing, in sympathy with the higher quotations from the other side. One sale is reported from Pittsburgh of 2000 tons at \$31, cash, a figure which is not credited by some importers here. There are a number of inquiries in the market. We quote nominally \$29 @ \$29.50, ex-ship, which is too high for business now.

Nail Slabs.—A large number of inquiries have come to hand for Foreign Nail Slabs, among them heavy ones for 1887 delivery for the West. Buyers offer \$28.50, but sellers demand \$29 @ \$30, which puts business out of the question for the present.

Steel Wire Rods.—The demand for immediate delivery has not quite exhausted itself, and, owing to the scarcity of available spot lots, as much as \$39.50 has been paid for moderate sized lots for immediate delivery. For future delivery better prices have been demanded and obtained on ac-

count of the rise in all classes of Steel abroad. We note one sale of 3000 tons at \$37, ex ship., which we quote.

Steel Rails.—The market continues active, and we are reported sales aggregating 40,000 tons by Eastern and Western mills. There are still a number of large inquiries in the market, among them one of 10,000 tons for the Union Pacific, and a few comparatively large blocks for New England roads. For December delivery of small lots \$35 has been paid for 1887 delivery; \$34 continues the nominal quotation at Eastern mill, and \$37 at Chicago.

Old Rails.—There have only been a few sales in the market, but there are large negotiations pending. The demand, which is quite active, comes chiefly from the West. We quote nominally \$22 @ \$22.50, the latter asked. Arrivals thus far have been light and to that extent bear out the statement that comparatively few rails have thus far been shipped.

Scrap.—We quote nominally \$19.50 @ \$20 from yard.

Rail Fastenings.—We quote Spikes 2.15¢ @ 2.20¢, delivery New York. Angle Fish Bars are still weak, and may be quoted 1.70¢ @ 1.90¢. Bolts and Square Nuts are 2.50¢ @ 2.75¢, and Bolts and Hexagon Nuts 3¢.

Philadelphia.

Office of The Iron Age, 220 South Fourth St., PHILADELPHIA, October 26, 1886.

Pig Iron.—The market maintains a strong tone, although new transactions have not been of much importance. The supply of good Iron is very light, however, and those who are compelled to buy have to pay full, if not higher, prices. The majority of large consumers appear to be pretty well covered for the present, and only the smaller class of buyers are paying the advance which is demanded by those who have material for sale. Still the chances are not unfavorable to holders. The current production is so steadily absorbed that there is no probability of accumulation, and without that sellers will be very firm in regard to new contracts. It is expected that the market will be rather quiet until the close of the year, at which time large buyers will doubtless endeavor to arrange for deliveries during the earlier months of 1887. A good deal of uncertainty exists in regard to what prices may be agreed upon, but without something unforeseen occurs it is not likely that the changes will be important. The unsettled condition of things in Europe is a factor not to be entirely ignored, but apart from that the indications are favorable for somewhat better prices, and in any event a very large volume of business is expected. In saying better prices it should be understood as referring to the lowest quotations of to-day, and not better than the highest. Sales have been chiefly on the basis of \$16.50 at tide for good Mill Irons and \$19 for No. 1 Foundry. Some brands are held at \$17 and \$19.50 @ \$20 respectively. These may become ordinary quotations in a few weeks' time, but any advance that is predicted must be on the first named, and are hardly probable on the last, although there is a possibility of such an event. Meanwhile business moves along easily, the demand being fully equal to the supply; hence entire confidence in values.

Foreign Iron.—The advance in foreign markets has cut off a good deal of business that was pending, but so far as can be learned in this vicinity holders show no signs of weakening. Bessemer for shipment is held at \$19.75 @ \$20.25, and 20% Spiegel at \$27 @ \$27.50. Sales of Bessemer in large blocks at slight concessions from quoted rates; demand improving.

Blooms.—Foreign Blooms are more or less nominal, the feeling abroad being very nervous and unsettled, in anticipation of higher prices. Asking prices are a little higher than given herewith, but on firm offers it is thought orders could be placed about as follows: Rail Blooms, \$27 @ \$27.50, c.i.f., duty paid; Nail Slabs, \$28.50 @ \$29; Sheet-Iron Billets, \$29 @ \$30; higher qualities for Boiler Plate, &c., \$36 @ \$38. American Blooms are in better demand as follows: Charcoal Blooms, \$50 @ \$52; Run-out Anthracite, \$44 @ \$45; Scrap Blooms, \$35, and Ore Blooms, \$34 @ \$35.

Muck Bars.—The demand is fair, but holders are firmer in their views and ask from \$31 to \$32 at mill, according to location, quality of Bars, &c. Sales during the week at \$30.50 @ \$31, but nothing below \$31 would be considered to-day.

Bar Iron.—The demand is not at all urgent, and prices show less firmness than they did two or three weeks ago. Car-builders are about the only large buyers, and it is difficult to secure orders from that source unless at comparatively low prices. The mills are well supplied with work, however, and in view of the firmness in Pig Iron, and other items of cost, it is not likely that concessions will be made unless prospects become much less favorable than they are at present. Skelp Iron is still in fair demand, and some of the mills have taken a few orders to fill in with at about 1.9¢ for Grooved, and 2.2¢ for Sheared; Best Refined Bars, 1.9¢ @ 1.95¢; Medium do., 1.75¢ @ 1.8¢.

Plate and Tank Iron.—This department appears to be in better shape than almost any other. Mills have plenty of work on hand, while daily applications are equal to the fullest capacity for production. Prices are firm; the difficulty is to make deliveries

rather than in regard to prices, which are about as follows: Ordinary Plate, 2.20¢ @ 2.25¢, delivered; Tank, 2.25¢ @ 2.30¢; Shell, 2.5¢; Flange, 3.5¢; Fire-Box, 4.25¢; Steel Plates, Shell, 3.25¢; Flange, 3.5¢; Fire-Box, 4¼¢ @ 5¢.

Structural Iron.—In this branch of the Iron trade there is plenty of business, with prospects of large amounts to come on the market during the early months of 1887. Meanwhile mills are running to their fullest capacity, and have enough to employ them for a good many weeks to come. In some cases proposals for new business have been declined, in others orders can only be placed by paying better prices. The outlook is exceedingly satisfactory and prices steady, as follows: 2.15¢ @ 2.2¢, delivered, for Angles; 2.25¢ @ 2.35¢ for Bridge Plate; 2.6¢ @ 2.7¢ for Tees, and 3¢ for Beams and Channels.

Sheet Iron.—The demand is well maintained, and with unusually small stocks prices are very firm, particularly for the high numbers. There is some probability of inconvenient scarcity, but in any case better prices are believed to be near at hand. Quotations about as follows for the best makes:

Best Refined, Nos. 26, 27 and 28.....	3½¢
Best Refined, Nos. 18 to 25.....	3¼¢
Common, ¼¢ less than the above.....	4½¢ @ 5 ¢
Best Bloom Sheets, Nos. 22 to 25.....	4¼¢ @ 4½¢
Best Bloom Sheets, Nos. 16 to 21.....	3¾¢ @ 4 ¢
Blue Annealed.....	2.6 @ 2.75¢
Best Bloom, Galvanized, discount.....	57½¢
Common, discount.....	52½¢

Steel Rails.—There is nothing of special interest to report in this department. A fair amount of business is entered from day to day, with prospects of a great deal to come forward during the winter and spring months. Meanwhile the mills have about all the work they can handle, so that there is no great anxiety in regard to loading up too heavily unless about \$34 @ \$34.50 at mill can be realized. These are likely to be inside rates for some time to come, but there is no disposition to make advances that would invite foreign competition.

Old Rails.—There is no change, prices being just about as they were a week ago. Sales have been made at \$22.25 for spot lots, but \$21.75 is the best bid for foreign shipments, which are held at \$22.

Scrap Iron.—Demand quite equal to the supply, so that prices are firmly maintained about as follows: No. 1 Wrought Scrap, tidewater delivery, \$19 @ \$19.50; Selected do., \$20 @ \$21; No. 2 do., \$13.50 @ \$14.50; Turnings, \$14 @ \$14.50; Old Car Wheels, \$15 @ \$16; Old Steel Rails, \$20 @ \$21; Cast Scrap, \$14 @ \$15; do. Turnings, \$10 @ \$10.50. Fish Plates about \$25.

Wrought-Iron Pipe.—An exceedingly strong demand prevails for all sizes; in fact, there are more orders for Pipe, November delivery, than can possibly be filled; consequently the least desirable orders are now being refused. Judging from the outlook there is not likely to be any cessation from the present activity for the balance of the year at least, and perhaps longer. Prices are very firm, the extraordinary demand giving all the mills a fair proportion of business, thus removing the temptation to cut prices. We quote discounts as follows: Lap-Welded Black, 52½¢; Butt-Welded Black, 40¢; Butt-Welded Galvanized, 30¢; Lap-Welded Galvanized, 35¢; Boiler Tubes, 47½¢.

Nails.—A fairly active market at quoted prices, \$2.20 from store, is the synopsis of the Nail trade. The cream of the fall trade is about over, but if production continues unabated we may possibly see Nails selling at lower prices. But when the fact that Bar Iron of medium quality brings 1.85¢ is taken into consideration there is no justifiable reason why Nails should not hold present price, even if they do not advance. There are several mills in this vicinity which for some months past have been closed for repairs, but in reality on account of the low price of Nails, claiming there is nothing to attract them at present in the manufacture of Nails.

Pittsburgh.

Office of The Iron Age, 77 Fourth Avenue, PITTSBURGH, PA., October 26, 1886.

The manufacturing interests of Pittsburgh are all doing well, especially the Iron and Steel trade. Not only are the mills all in operation, but many of them are working up to their full capacity. The railroads centering here never had as much to do as they have at present, and some report that they could do a good deal more if they only had the facilities. It is true there is an active competition in nearly all departments of trade, and margins for profits are not as satisfactory as they might be, but if the present demand keeps up, and there is no good reason at present why it should not, manufacturers will doubtless be able to realize before long better prices for their products.

Pig Iron.—The market has been active and strong the past week, and prices have again advanced. The advance on Mill Iron during the time under review has been from 50¢ to 75¢ per ton, some sales reported showing an advance of \$1. The consumption is very large, larger than ever before, and notwithstanding the production exceeds that of any former period, there is no accumulation of stock; on the contrary the visible supply is being reduced. The Marshall Iron, which has been a bugbear to furnacemen ever since the collapse of Mr. Marshall, who had about 60,000 tons bought, is steadily

going into consumption. Consumers generally do not like it, but they are buying it because it is considerably cheaper than other Irons. The great objection to it is that it consists of different qualities and makes, and the buyer has to take it on its merits. It is mostly held by banks and insurance companies, by whom it was taken as collateral for money loaned to Mr. Marshall. Nearly all the furnaces, not only here, but in the Shenango and Mahoning valleys, are sold from one to three months ahead, and a representative of the Southern Iron regions reports the Southern furnaces in a similar condition. Quotations may be given as follows:

Neutral Gray Forge.....	\$17.00 @ \$17.50, 4 mos.
All-Ors Mill.....	18.00 @ 18.50, 4 "
White and Mottled.....	16.00 @ 16.50, 4 "
No. 1 Foundry.....	18.50 @ 19.00, 4 "
No. 2 Foundry.....	17.50 @ 18.00, 4 "
No. 3 Foundry.....	16.50 @ 17.00, 4 "
Charcoal Foundry.....	23.00 @ 24.00, 4 "
Cold-Blast Charcoal.....	25.00 @ 26.00, 4 "
Bessemer Iron.....	19.50 @ 20.00, 4 "

Sales of Mill Iron have been made at \$17 @ \$17.50, four months, and Bessemer at \$19 @ \$19.25 cash, but as yet above the inside quotation. A sale of 4000 tons of Bessemer was reported yesterday, but the price was not divulged. Several sales of Southern Iron were made during the week; among others a lot of 500 tons (Alabama) mill at \$16.70, four months.

Muck Bar.—Continues in demand, and prices have advanced, in sympathy with Pig Iron; sales at \$28.50 @ \$29 for immediate and \$29.50 cash for November and December delivery. The above prices show an advance of about \$2 per ton within a few weeks, and the indications are that it will go still higher, as it has not advanced as much as the raw article.

Manufactured Iron.—The demand keeps up well. Mills continue busy and prices are firm, with indications of going still higher. Manufacturers are still booking orders for immediate or near-by delivery on a basis of 1.75¢ for Bars, but they are refusing to book orders for future delivery unless with the understanding that they are to have market price at time of delivery, whatever that may be. Finished Iron is still low when the enhanced cost of the raw article is taken into consideration, and it is evident that prices of the former will have to go higher. In addition to the regular Merchant Iron trade there is a good demand for specialties, and the outlook at present warrants the belief that the mills will have all they can do until the close of the present year, and this may continue to be the case all winter.

Nails.—There is a fair business for the season, and prices are firm at the association rates. It is complained that Nails are too low as compared with the enhanced cost of Nail Plate, and manufacturers here say that unless there is an advance they will shut down their factories. The next meeting of the Western Association may order an advance. We continue to quote in carlots at \$2 for Iron and \$2.10 for Steel, 60 days, 2¢ off for cash. Jobbers need not be timid in regard to buying Nails at present prices.

Wrought Iron Pipe.—There is no change to note in this interest; mills are all as busy as they can be, and the probability is that this will hold out until the 1st of January. Some of the mills have orders enough booked now to keep them going until the close of the present year. Prices unchanged. Discounts on Black Butt-Welded Pipe in carlots, 42½¢; Galvanized do., 32½¢; Black Lap Welded, 55¢; Galvanized do., 37½¢; Boiler Tubes, 47½¢; Casing, all sizes, 47¢; 2-inch Tubing, 15¢ per foot; 8-inch Drive Pipe, \$1.40.

Steel.—Of all kinds is firmer, in sympathy with the enhanced cost of raw material, and higher prices soon are not improbable. Best brands of Refined Cast Tool Steel, 8¢ @ 9¢; do. Crucible Machinery, 4¢. Bessemer Blooms and Billets firm and higher; \$32 @ \$33 per ton; Nail Slabs, \$31.50 @ \$32. Rail Ends and Bloom Ends—none to be had, and there is inquiry for them. In the absence of sales it is difficult to give reliable quotations in the present condition of the market.

Old Rails.—Old Iron Rails may now be quoted at \$24.75 @ \$25.25, as to quality, delivery, &c. A sale of Old Steel Rails is reported at \$25.50 for long lengths. The latter appear to be much scarcer and harder to obtain than Iron Rails, and there is considerable inquiry for them.

Steel Rails.—There have been no new features developed during the past week; mills here are sold for several months ahead, and are unable, in consequence, to take any orders for immediate or even near-by delivery.

Railroad Track Supplies.—There is a very good demand, and prices are firm and will probably be advanced soon. Spikes, 2.40¢, 30 days, delivered; Splice Bars, 1.70¢ @ 1.75¢; Track Bolts, 2.75¢ with Square and 2.85¢ @ 3¢ with Hexagon Nuts.

Old Material.—There is an improved demand for everything in this line, and with light stocks prices are firm and advancing. We now quote No. 1 Wrought Scrap at \$19 @ \$20, net ton; Wrought Turnings, \$14 @ \$15; Old Car Axles, \$24 @ \$25; Cast Borings, \$12 @ \$13, gross; Old Car Wheels, \$17 @ \$17.50, gross, with but little demand for latter; Open-Hearth Scrap Steel, \$20.50 @ \$21.50, gross ton.

Window Glass.—There is a fair business, but no change in prices. Discount, 70 and 10¢ on Single and 75¢ on Double Strength.

Coke.—Blast-furnace Coke remains unchanged at \$1.50 per ton, free on cars at ovens.

Chicago.

Office of The Iron Age, 36 and 38 Clark St., Cor. Lake St., CHICAGO, October 25, 1886.

Last week the sales of most lines of merchandise fell off considerably, consequent upon the lateness of the season and the mild weather which has prevailed. In all commercial centers of the West merchants have an excellent season's trade. The decline is therefore received with less regret than for several years previous, but the season is by no means ended. All that is needed to revive the call for a large line of goods is settled cold weather. Country merchants now have fair stocks of general merchandise, and will not duplicate their orders to any large extent until consumption of seasonable articles increases. Farmers have marketed their grain with more freedom than usual in full seasons, but prices have been low, which curtailed the amount of money they had to expend and somewhat restricts collections. The meat packers' strike in this city ended with the employees returning to work at the 10-hour a day system, and the backbone of the switchmen's strike at Minneapolis and St. Paul is so badly broken that freight is now moved with very little inconvenience. The closing of the building season has weakened the price of Lumber, and cargoes of Green are now quoted at \$9.50 per 1000 feet. The majority of yards are well stocked, and should further receipts be large a greater decline may be expected. The heavy orders of railroad companies for cars, locomotives and railway material in general have caused a further advance in Manufactured Iron, and all Western mills have all the work they want. The general increase in the demand for all kinds of Iron is causing idle works everywhere to be put in operation, and many of the rolling mills are preparing to puddle Iron on account of the scarcity of Old Rails and the high prices demanded. At the moment there is every prospect that this season of activity will continue through the winter months.

Hardware.—As the month draws to a close there is a noticeable decline in the demand for goods. Jobbers have been fairly busy in filling orders during the past week, but those coming in are for less quantity, and cover fewer lines of goods. Builders' Hardware and Shelf Goods are in good demand for the leading articles, with prices, as a whole, steady. Some irregularity is noted on Tacks and Screws, both being apparently weak in a general way. Orders for Stove Boards, Coal Hods, Granite Ware, Stamped Ware, Cutlery and winter specialties have increased in volume and number, but not enough so to offset the falling off in other articles, which leaves the market a little less active than the week previous. In Heavy Hardware and Wood Stocks the market is unchanged, short supplies and firm prices continuing.

Barb Wire.—The report that Wire Rods have been advanced in foreign markets has had a tendency to stiffen up the price of Barb Wire by makers. While it is believed that stocks are in fair condition, there appears to be an inclination to hold the Wire at higher figures, on the ground that it cannot be replaced at the increased cost of Wire. This, however, has not changed their quotation of 3¢ for Painted and 3¼¢ for Galvanized Wire in round lots, but some who were anxious to sell heretofore at these figures are now reluctant to name prices, and not infrequently demand an additional 10¢, both for immediate and future delivery. Jobbers renew the quotation of 3¼¢ for Painted Wire and 4¢ for Galvanized in small lots from store. From the falling off in carload orders it would seem that the heavy dealers are fairly well supplied. The inquiries for small lots, immediate delivery, are increasing, and trade for the next 30 days promises to be very good.

Nails.—The situation is about the same as last reported. The scarcity of Steel Nails holds the price firmer on this quality than on Iron, the nominal quotation being \$2.30 and for Iron Nails \$2.20 in small lots, 5¢ off in carloads. The fact that the supply of Iron Nails promises to increase creates grave apprehension that the difference in price will be increased through competition. Prices are now shaded on both classes in special cases, with an intensified weakness on Iron Nails. Mills are nearly all in operation, and some who are not sold very far ahead are looking for additional orders for delivery 60 days hence. Manufacturers continue to quote Steel Nails at mill \$2.10, net, 60 days, 2¢ off 10 days, but are a trifle weak on their prices for Iron, nominally sustaining the 10¢ per keg difference. Manufacturers have advanced prices on Wire Nails to \$3.55 in 25-keg lots, and jobbers have changed their figures accordingly.

American Pig Iron.—There seems to be but one thing to say about the market. Its course for the past three months has been one of increasing firmness from week to week, with now and then a lull in the demand, but no receding or even weakening in price since the upward movement began. Buyers continue to seek Iron, and must be content with taking less at a time than as a class they desire. In carloads to 100 tons the supply is equal to the demand, but when it comes to contracting for lots extending

beyond this year's delivery all Irons are very scarce. None of the Charcoal furnaces have large stocks, and can dispose of all they have in small lots at full quoted prices. Even in the present condition of the market larger orders might be placed if buyers would pay the top figure. Custom in past years warrants them in demanding concessions on account of quantity, and their inability to cut prices is not yet barren of surprise. One of the best indications that standard brands are not plentiful is the taking of "off" Irons, which is never done when stocks are abundant. The fact that production of Charcoal Iron cannot be largely increased, and that the present rate of consumption promises to exceed the output, encourages makers in the belief that a still higher scale of prices is probable. Coke Irons share the same features of the market, but are not as a class contracted for so far ahead, so that Coke-Iron makers are likely to realize the advance on all their product at an earlier day than the makers of Charcoal. Consumers should remember that great blocks of Iron were contracted for at very low figures before the upward movement began, on which the present fair prices are not received, while the increased cost of labor and material is applicable to the entire output. If buyers are conservative in their purchases, buying only for immediate use, the market is likely to remain steady at about present figures; but should the Car Wheel makers and large Malleable Iron manufacturers persist in placing orders covering the first six months' delivery in 1887 prices may be forced several dollars per ton higher before the close of the year. For this year's delivery we quote Lake Superior Charcoal, \$20.50 @ \$21 in small lots; Coke Irons, All-Lake Ore, \$19.50 @ \$20.50. In Ohio standard Blackbands some choice brands are unobtainable at any figure; others can be had in small quantities at from \$20 to \$21; Hanging Rock Softeners, \$19.50 @ \$20. On Southern Iron both sales agents and furnacemen claim that another advance of 50¢ per ton has been made. Sales are reported at other points which, by adding freight rates, would make the prices, Chicago delivery, from \$1 to \$1.50 per ton above prices quoted on No. 2 Foundry. Upon the other hand a sale of 1000 tons is reported in this market at 50¢ per ton less than our quotations, but not verified. There can be no doubt but what the Iron is scarce; makers stiff in price and indifferent about making sales except at full rates. With all due respect to reported higher prices we make the following quotations, which, it is believed, represent the actual market value for the week: Foundry, No. 1, \$19 @ \$19.50; No. 2, \$18 @ \$18.50; No. 2 1/2, \$17.75; No. 3 and No. 1 Mill, \$17.25.

Merchant Steel.—The demand for Steel is very fair, and it is a trifle stronger in price. There has been considerable improvement in the demand for cheap Steel recently, and an advance of about \$1 per ton at mill is reported. From mining districts Tool Steels and Drill Rods have been in very good request. Implement Steels are reported quite active for the season. On small lots from store we quote as follows: Low-grade Tool Steels, 7¢; standard brands, 7 1/2¢ @ 8 1/2¢. Crucible Machinery, Round and Flat, 4 1/2¢ @ 5 1/2¢; Spring Steels, railroad sizes, 4¢; Open-Hearth and Bessemer Steels, 2 1/2¢ @ 3¢; Plow Steels, 4 1/2¢ @ 5¢.

Steel Rails.—Makers report that the demand up to the present has been considerably above that of last year. A great many applications have been received for Rails from buyers who have as yet only approximated quantity and time of delivery. Makers are exceedingly careful regarding statements as to quantity taken, but acknowledge that they have contracts for sufficient work to keep them employed at least two-thirds of next year. Transactions so far as learned have been made on a basis of \$37 @ \$37.50, according to the circumstances and relations of the customer. There is every prospect that all the mills in this locality will run full during the entire winter with the exception of a few weeks for repairs during the holidays.

Structural Iron.—There were no new orders offered during the week on contracts, but the demand for small lots from yard is very good, which agents here are unable to supply. In bridge works specifications are being prepared for material that will be wanted early in the spring, for which contracts will possibly be let before the close of this month. We renew the following quotations: Beams and Channels, combination price, 3.10¢; store price, 3.50¢; Angle Iron, 2.40¢; T Iron, 3¢; Flitch Plates, 2 1/2¢ @ 2 3/4¢.

Bar Iron.—The demand continues active. Mills report that they are full of work and not taking contracts for large lots at present prices, and demand 2¢ rates for future delivery when extending over 60 days. Many of them, in fact, refuse to take orders for any specified time when they cannot take them for immediate shipment. From store on Best Refined New Puddled Iron jobbers quote 2¢ in small lots, and 1.90¢ to country merchant trade in round lots; Common Iron, city trade from store, 1.95¢ @ 2¢ in small lots, 1.85¢ @ 1.90¢ to country merchant trade. Makers are asking 1.75¢ @ 1.80¢ rates at mill in some sections, while others who are contracted further ahead are asking 2¢.

Galvanized Iron.—Mill agents report an excellent trade in small lots for the week to the larger consumers and small jobbers. From store trade has been fairly good. Quotations continue to be 60 and 5¢ off on Juniata and 60, 10 and 5¢ off on Charcoal. There has been considerable talk of advance in price of Galvanized Iron during the last month, but no one appears to take the initiative. Jobbers complain that they are selling Iron without profit, and makers hold that they will not take further orders at present prices, yet the market continues to be in the same condition as it was 30 days ago.

Black Sheets.—The market on Light Sheets is weak and demand not what was expected. Stocks in the hands of jobbers are pretty full, and yet a number of mills are seeking orders. Manufacturers' price on light numbers is about the same as it was during September, but from store a trifle firmer. We quote as follows: No. 24, 2.90¢; Nos. 25 and 26, 3¢; No. 27, 3.10¢. On Heavy Sheets the market is much stronger in price and stocks light. It is with difficulty that any orders can be placed with mills for the heavier grades, and especially in this the case in Plate and Tank Iron.

Old Rails.—There continues to be a good, strong demand at prices ranging from \$23.50 to \$24. A sale of a small lot is reported at \$23.75 and another of 300 tons at \$24.50. Mills in this vicinity report that they will not pay over \$24 for Rails, as it will be cheaper for them to puddle Iron than go above this figure. There are sellers in the market who are still asking \$25, but the entire quantity that has been offered will not aggregate 7000 to 10,000 tons.

Old Wheels.—A sale of 1000 tons is reported, covering three months' delivery; \$17, spot cash, has been offered by another purchaser and refused. Many of those who are now buying Wheels are makers who were sellers of Wheels three months ago. There are not many buyers who would be willing to pay more than \$17.50 @ \$18, and very few who can afford to pay the top prices. It is believed that large quantities are concentrated in the hands of a few men who are waiting for better figures. Stocks at least are not heavy, while the demand appears to be increasing. Railroad companies are contracting for Cars to a greater extent than was anticipated. Many of the Wheel makers have orders sufficient to carry them over half of next year, according to reports.

Scrap Iron.—The demand for all kinds of Scrap continues strong and prices firm at the following quotations: No. 1 Forge, \$19.50 @ \$20; No. 1 Mill, \$15.50; No. 2, \$10.

Pig Lead.—The Lead market felt the depressing influences and declined rapidly from 4.20¢ to 3.90¢ at the close of the week. Sales have been confined to small lots only and principally for the local trade.

Messrs. Forsythe, Hyde & Co., Pig-Iron commission merchants, 50 Dearborn street, Chicago, were appointed sole sales agents for the Bangor Pig Iron on the 18th inst.

Birmingham.

BIRMINGHAM, ALA., October 25, 1886.

If the business of this region be taken as an index, the statements now going the rounds of the daily press, showing remarkably increased earnings of the railroads, are credible enough. The wisdom of the change of gauge last spring already appears quite conclusively to one who has given a little study to transportation and traffic conditions, while the general prosperity of the country is doing even a great deal more to swell tonnage figures. There is not a road traversing the territory now but finds its traffic embarrassingly ahead of its equipment. On some of the lines for days and days lately it has been impossible to get a car for certain lines of freight. One furnace company has nearly 60 carloads of Iron in its yard sold, waiting to be moved. After such experiences as this it is an interesting piece of news that one road, which is the principal carrier of business between the Eastern cities and this place, will soon receive a considerable acquisition of rolling stock. A local item of some importance, because presaging the building of another line to the East, is the purchase of \$60,000 worth of ground for the terminal accommodations and shops of the Georgia Central road.

Pig Iron.—Is up sufficiently now to encourage expectation of a genuine boom. Transactions of the last few days indicate a rising market, with extraordinary activity. It is considered quite a point, for instance, that one concern has been able to sell No. 2 Foundry Iron to New York at a price that pays \$15 cash here. No. 1 Mill Iron of the same make has sold to St. Louis at \$13, net, which is \$1.25 above offers received from the same quarter 40 days ago, and No. 2 to other points for \$11.90, 5¢ more than the highest price booked anywhere in the district up to a week ago. A noteworthy feature of the situation is an indisposition to sell even at top figures. This, combined with contracts that call for Iron not yet made, has taken all but two concerns out of the market for the time being.

Finished Iron.—The temporary inadequacy of the local supply in this line has come to be almost serious. More than one

enterprise has important work awaiting supplies from the rolling mills. There is some talk, though not at all definite, of new mills.

Cast Pipe.—Which, as it seems, hardly any other producing city except Birmingham has to offer at any price, is up easily \$2 here. Large sizes sell freely at \$30 @ \$32 a ton. The local manufacturer sees his present advantage clearly enough not to make troublesome small sizes at all.

Nails.—There is sufficient upward movement in Iron Nails to make the market quite uncertain. Quotations received in the last few days for delivery here range from \$2.18 to \$2.25. Steel Nails are hard to get at the association price of \$2.45.

Miscellaneous.—In almost everything that is left for this heading the demand here exceeds production. Manufacturers are unable to get stocks ahead, and repair shops are crowded with work. In the shops and foundries orders for pumping and hoisting machinery and Railroad Supplies are still conspicuous. In the matter of new enterprises the solid prosperity of those in operation is bearing its natural fruit. Another new concern has been chartered, with \$100,000 capital, under the title of the Birmingham Corrugating Company, some of the leading Iron men of the town being concerned in it. The bulk of their product at first will be Corrugated Iron in one shape or another. J. P. Witherow, of Pittsburgh, who is to do the same work for the Sheffield Furnace Company's stock, has been awarded a contract to build three Whitwell stoves for the furnace of Messrs. Ensley & Shook and associates at Sheffield, Ala. The Mary Furnace Company, Birmingham, are drying out a Whitwell stove built by Mr. Witherow. Col. E. W. Cole, retired railroad king of Nashville, Tenn., and associates have closed a deal with the Sheffield Land, Iron and Coal Company, by which, according to daily newspaper dispatches, they are under engagement to build three 100-ton furnaces at Sheffield, Ala. The excavation for the Pratt Coal and Iron Company's furnace, near Birmingham, Ala., has been enlarged to take in the three others which the management have had in contemplation for some time. Ground has been broken at Avondale, just out of Birmingham, Ala., for the Avondale Iron Works, which will make Elevators and Hoisting Machinery and a variety of Structural Specialties. The Baxter Stove Works, Birmingham, Ala., which will probably go into operation in the next 10 days, already have about as many stoves sold as they can make in four months.

Chattanooga.

Office of The Iron Age, Carter and Ninth Sts., CHATTANOOGA, October 18, 1886.

A retrospect of the business of this district shows a quiet, conservative advance in nearly all lines of trade, both in volume and prices. Business all through the South may now be said to be satisfactory and prices fairly remunerative. Those who are erecting new manufacturing concerns are pressing them to completion as fast as possible, with a view of getting in some of their products on what some consider high figures. The weather through the early fall so far has been very propitious for the gathering of crops, and the cotton crop especially has been largely benefited by it, and the yield is turning out much better both in quality and quantity, although prices are ruling low. Of course the most active districts are those at and around the manufacturing centers; at the same time the suburban sections are also benefited. The railroads, too, are at the present time having more business offered them than they can do, and, realizing the great scarcity of rolling stock, have ordered nearly 3000 cars to be finished at an early day. The demand for light section Rails is almost unprecedented, but great difficulty is being experienced in getting orders filled with anything like promptness, which is and will be for some time to come a great drawback to the early completion of many enterprises that are now under way. The construction of new furnace plants is going on briskly, and several new enterprises in this line are being talked of.

Pig Iron.—This article is so staple and prominent all over the United States that it would seem superfluous to state the fact that it also sympathizes with all other classes of merchandise. There has been an increased demand, and prices have gradually gone up a few points with those who have any to sell; these, however, are confined to very few, who are reluctant to quote prices excepting at the top of the market, which now ranges at about \$15.50 for No. 1 at the furnaces, with \$1 less as the grades go down. A few round lots of No. 1 have been sold on this basis, while a sale of 3000 tons No. 4 at \$12.50, net, at the furnace is a fair indication of the figures of the lower grades.

Old.—The question of this article is still a vexed one with the furnaces—not so much now of the quality, but of its scarcity; if the quantity were increased 20% it would no more than fill up the gaps in the wants of the furnaces, and unless a much further development is made in the general output much serious embarrassment will ensue, especially as the new furnaces commence going in blast.

Miscellaneous.—Lumber still is as active as ever, and all grades and kinds meet with

ready sale at the highest market rates. The demand has been of late very imperative for car sizes, and several large contracts have been taken by different mills in Georgia. The demand for Poplar, Black Walnut and Cherry in our local market has been very great. There is still a great scarcity in capacity of the furniture factories to fill orders, and they are several weeks behind.

Cleveland.

CLEVELAND, October 25, 1886.

Pig Iron.—A sale of 1000 tons of Red Short Iron, four months, at furnace, at \$16.55 is reported. Two smaller lots of the same Iron were disposed of at \$16.75 cash at furnace. Advances of from 25¢ to \$1 per ton on all kinds of Charcoal Iron Ore reported. The Pig-Iron market seems stronger than last week in every respect. Furnacemen in several instances have asked their agents to take no more orders for Iron at any price. There is a casual demand, and the production of the furnaces seems well sold up. Sellers, with scarcely an exception, are demanding better prices. The volume of business for October may fall slightly below that of September, but prices have been much better. For No. 1 Foundry, All Lake Ores, \$18.50 is freely paid at the furnaces, and several sales at better figures are reported. There seems to be no danger of an accumulation of stock at the furnaces. Local quotations are as follows:

Charcoal Pig Iron.
Nos. 1 and 2 L. Superior Charcoal, \$21.50 @ \$22.50
Nos. 3 and 4 Lake Superior, 21.50 @ 22.50
Nos. 5 and 6 Lake Superior, 21.00 @ 22.00
Southern Car-Wheel, 25.50 @ 28.50

Bituminous and Coke Irons.
No. 1 Bessemer, 19.00 @ 19.50
No. 2 Foundry, All Lake Ores, 19.00 @ 19.50
No. 3 Foundry, All Lake Ores, 18.00 @ 18.50
No. 1 Foundry, Lake Ores with Cinder Mixture, 18.00 @ 19.00
No. 2 Foundry, Lake Ores with Cinder Mixture, 17.25 @ 18.25
No. 1 Silvery, Native Ohio Ores, 17.50 @ 18.50
No. 2 Silvery, Native Ohio Ores, 16.00 @ 17.00
No. 1 Gray Forge, Red Short, 17.25 @ 17.75
No. 1 Gray Forge, Neutral, 16.30 @ 16.70

Iron Ore.—Although very few important transactions have occurred during the week, the Iron-Ore market is very strong. The shipment of Ores to the furnaces continues brisk, and the docks will be fairly well cleared by the time navigation opens next spring. There is no change in Lake freights, and the carrying rate remains unprecedentedly high. It is believed that there will be still further advances. The shipments from the upper lakes have been as follows: Escanaba, 1,230,717 tons; St. Ignace, 62,250 tons; Marquette, 725,942 tons; Ashland, 612,993 tons; Two Harbors, 264,334 tons. It is difficult to correctly analyze the market, which, however, may be said to be strong. Buyers and sellers are both waiting, the former in the hope of buying cheaper, and the latter preferring to see more of stock and prices before offering to do much in the way of sales. The quotations are as follows: No. 1 Specular and Magnetic Bessemer Ores, \$6.00 @ \$6.50
No. 1 Specular and Magnetic Non-Bessemer Ores, 5.75 @ 6.25
Bessemer Hematites, 5.50 @ 6.00
Non-Bessemer Hematites, 4.50 @ 5.00
Manganese Range, Bessemer Ores, 5.25 @ 6.00
Manganese Range, Non-Bessemer Ores, 4.50 @ 5.25
Goebels Range, Bessemer Ores, 5.00 @ 6.00
Ores for Mill use, 5.50 @ 6.00

Old Rails.—Business is fairly active. From \$22.25 to \$23.75 per ton for Old Rails has been paid during the week. A small lot is said to have been sold at \$24. About \$22.75 is an average quotation. Old Car Wheels are worth from \$17 to \$18 per ton. Railroad Scrap Iron is worth about \$20 per ton, with an active market.

Cincinnati.

CINCINNATI, October 25, 1886.

Pig Iron.—As confidence grows and previous advances have been fully sustained the market gathers strength, and the result at the close of the past week was another rise of 50¢ to \$1 per ton. The supply of desirable Iron available has gradually diminished and the demand has continued quite active, but as the Southern furnaces become eliminated and the Northern stacks refuse to change their policy of taking orders the volume of business has been of less magnitude, yet a number of orders for 1000-ton lots have been placed by local dealers for both Foundry and Mill Iron. It is a fact worthy of note that some furnaces place a higher price upon round amounts than upon smaller quantities, and yet the small buyers have been less in the market, being slower to move than those whose wants are larger. The advance which has been obtained this week was first secured by Southern producers, notwithstanding their avowed course to hold the market level and deprecate a rapid rise, while the Northern output has been sold a little more readily, with prices sympathizing with those current for Southern Metal. It is inferred from the conditions present that the major part of the business done now is for forward delivery. It is claimed that at all the furnaces, both North and South, dealing through Cincinnati, there is now but a four or five weeks' supply in sight. Shipments to all Western points are large. Louisville is credited with having been the center of activity and buoyancy in the West during the past few days. It is stated that 16,000 tons were sold there this week, a small proportion of which was through Cincinnati representatives. The Iron thus sold is said to be speculative holdings [purchased last December. Car-Wheel Iron is scarce and is advancing rapidly, the better grades more so than

Foundry Iron. Charcoal Iron, though moving slowly, as compared with Coke Metal, is gradually hardening, with light offerings of the most desirable brands. The fact is noted that Iron of Southern production has sold in Pittsburgh during the past week at prices above those which it was possible to obtain for the native Neutral Iron of that region. The Williamson Furnace, of Alabama, which blew in about three weeks ago, has already been sold up for seven months, on a basis of \$17 @ \$17.50 for No. 2 Foundry. At the close No. 2 Foundry has been sold on a basis of \$18, cash, here. Latest information is that the demand for Southern Car-Wheel Iron is active and urgent. We make another revision of prices, quoting for cash, f.o.b. cars at Cincinnati, as follows:

Charcoal Foundry.
Hanging Rock, No. 1, \$21.00 @ \$22.00
Hanging Rock, No. 2, 19.50 @ 20.50
Southern No. 1, 19.50 @ 20.50
Southern No. 2, 18.00 @ 18.50

Coke and Coke Foundry.
Ohio Soft Stonecoal, No. 1, 18.00 @ 18.50
Ohio Soft Stonecoal, No. 2, 17.00 @ 17.50
Southern Coke, No. 1, 18.50 @ 19.50
Southern Coke, No. 2, 17.50 @ 18.00
Ohio and West Pennsylvania Coke, No. 1, 20.00 @ 21.00
Ohio and West Pennsylvania Coke, No. 2, 18.50 @ 19.00

Forge.
Strong Neutral Coke, 16.00 @ 16.50
Mottled, 14.00 @ 15.00
Southern Coke, 16.25 @ 16.75

Car-Wheel and Malleable Irons.
Southern Car-Wheel, 23.00 @ 25.00
Hanging Rock, Cold Blast, 26.00 @ 27.00
Hanging Rock, Warm Blast, 31.00 @ 32.00
Lake Superior and Malleable, 32.00 @ 33.00

Manufactured Iron.—A strong and buoyant tone has prevailed, with an active demand. The new Mount Auburn Cable Company are reported to have made a contract for 2200 tons of Wire for necessary construction with Springfield and Cincinnati firms, the former city proving the more fortunate in securing the cream of the prize. We quote Bar Iron, 1.65¢ @ 1.75¢; Charcoal Bar Iron, 2.05¢ @ 2.75¢; Sheet Iron, Boiled, Nos. 10 to 27, 2 1/4¢ @ 3¢; Sheet Iron, Charcoal, Nos. 15 to 25, 2 1/2¢ @ 4¢ per lb.

Old Rails.—There has continued to be a good demand for both Rails and Wheels, and a firm tone has prevailed under light offerings.

Scrap.—For Rails we quote \$23 @ \$23.50, and for Wheels \$16 @ \$17.

St. Louis.

ROGERS, BROWN & CO., St. Louis, W. H. SHIELDS, manager, report as follows, under date of October 25, 1886: This market the past week has felt the full force of the improvement noted from other points. It has been remarked that important changes in the Iron market have begun in the far West and extended eastward. This seems to be the case at present, the Western country being stimulated into marked activity. Much of the present strength comes from heavy railroad building by the Missouri Pacific and Santa Fe in and about the Missouri River district. It is reported that the Missouri Pacific will build 1000 miles of new track in addition to their already very large system, taking in some favorable branches already built. Many of these roads are feeders to Coal and other mines. These enlargements bring heavy orders for Rolling Stock and other Iron Material into the market. The small foundries are receiving a stimulus to their work also. There has been no important change in prices since our last report, but a steady stiffening all along the line, and we quote to-day as covering the run of actual transactions the following cash figures, f.o.b. cars at St. Louis:

Charcoal Foundry.
Missouri, nominal \$19.00 @ \$20.00
Southern, 18.00 @ 21.00

Coke and Coke Foundry.
Southern, No. 1, 19.00 @ 19.50
Southern, No. 2, 18.00 @ 19.00
Ohio Softeners, 18.00 @ 22.00

Mill Iron.
Missouri, nominal 17.00 @ 18.00
Southern, No. 1, 17.00 @ 18.00
Southern, No. 2, 16.00 @ 17.00

Car-Wheel and Malleable Irons.
Southern, 22.00 @ 25.00
Lake Superior, 22.00 @ 25.00

Scrap, &c.
Old Wheels, 17.00 @ 18.00
Old Rails, 22.00 @ 23.00
Connellsville Coke (Frick), 5.65

Baltimore.

W. N. WYETH, Iron and Steel merchant, 46 and 48 South Charles street, reports us the following, under date of October 25: Since our last report, and as herein stated, trade has largely improved, accompanied by an advance in values, and to-day the outlook is most encouraging for yet higher figures in the near future. This especially applies to Manufactured Iron in all its various forms. Steel Rails and Plates, Boiler Tubes and Wrought Pipe, as well as Tool, Tire and Toe Calk Steels. We quote the list firm and advancing as per annexed list:

Ref. Bar Iron, 1 to 6 3/4 to 1 1/2, \$1.90 @ 2.10¢
" " 1 to 4 1/2 to 1 1/4 to 1, \$1.90 @ 2.10¢
" " 3/4 to 2, Round, \$1.90 @ 2.10¢
" and Square, \$1.90 @ 2.10¢
Hoop Iron, 1 1/4 wide and upward, \$2.40 @ 2.60¢
Band Iron, from 1 1/4 to 6 in. wide, 2.35 @ 2.65¢
Horse Shoe Iron, 4 1/2 @ 4.50¢
Norway Nail Rods, 4 1/2 @ 5 1/2¢
Black Diamond Cast Steel, \$4 @ 5 1/2¢
Machinery Steel, \$4 @ 4 1/2¢
Spring Steel, \$4 @ 4 1/2¢
Common Horse Nails, \$4 @ 4 1/2¢
Railroad Spikes, 5/8 x 9-16, \$2 1/2 @ 3¢
Perkins's Horse Shoes, \$2 @ 2 1/2¢
Mule Shoes, \$1.50 @ 1.75¢
Boiler Tubes, 4 1/2 @ 4 1/2¢

A railroad is about to be built from the Lake Shore branch near Youngstown, Ohio, to Sharpville, thus reaching the large number of rolling mills and furnaces which have heretofore been supplied by the Nypeno and Pennsylvania lines.

Trade Report.

General Hardware.

During the last few weeks there has been little variation in the volume of trade, which continues fair. Prices are as a rule quite firm, the continuing strength in raw material contributing much to this result. In Heavy Hardware, which lies near the raw material, the tendency toward slightly advanced quotations is perceptible. Manufacturers are pursuing a conservative course and not producing goods much in excess of the near requirements of their trade. Orders from jobbing houses indicate that in many lines their stocks are running low, but most of them have a supply of goods which were purchased prior to the advances of the past few months. Collections are generally reported fair, with a little tendency to sluggishness, and the disposition on the part of some to take the time on which goods are sold instead of availing themselves of cash discounts.

NAILS.

In the markets tributary to New York there have been few changes of note. The demand continues moderate, though a slight improvement is noted in this direction. There has been more business, too, for export and for the Pacific Coast. A number of the mills have been troubled with breakdowns in rolling stock, and others have been shipping some of their output westward. Prices continue low at \$1.95 to \$2 from store, with usual abatement for carload lots. So far as can now be judged the first impetus toward improvement in the Nail trade must come from an advance in the raw materials, and in this respect new elements have been coming in. The advance in Old Rails, due to the heavy demand upon Iron rolling mills, led to heavier sales of Puddled Bars, which in turn rose, Mill Pig advancing simultaneously. This made Steel Slabs, and notably Foreign Steel Slabs, relatively cheaper than Iron as a raw material, while in the West the advance in Bessemer Pig and the heavy demand for Rails—not "Nails," as we had it in our last issue—caused a scarcity of Steel Nail Slabs there. The latter has gone so far that some mills which have arranged for making Steel Nails have already returned to making Iron Nails. Meanwhile the sales of Rails, Rail Blooms, Wire Billets, Nail Slabs, Plate Blooms, &c., by foreign Steel works have given the latter so much confidence that they are asking higher prices, a contingency all the more to be expected because the majority were selling at a loss. For the present the raw material, from the Mill Pig, Old Rail and Puddled Bar for Iron Nails, and from the Bessemer Pig to the Slab and Steel Nail Plate, both foreign and domestic, for the Steel Nail, has developed a rising tendency. This means growing cost of production, which must weigh heavily upon the weaker mills forced to sell current output, and must increase the tendency among the stronger ones to restrict sales and pile up stocks.

BARB WIRE.

The demand in the New York market is still very small, and little activity is expected until after the opening of the new year. We continue to quote 3.85 to 3.90 cents for carload lots of Four-Point Galvanized Barb Wire.

MISCELLANEOUS PRICES.

The market for common Carriage Bolts is firm, and the prices of the associated manufacturers are maintained by them, and are more closely adhered to by the jobbers than heretofore, who are still to some extent competitors among themselves for trade at a trifle under pool prices. Some of the larger jobbers have, however, already been compelled to replenish stocks at the new prices, and as the old orders are exhausted there will be, it is anticipated, a cessation of the irregular competition. The fact that the trade generally recognizes the probable stability of the pool has the effect of giving further strength to the market.

The price list of the Screw Driver manufactured by the Standard Tool Company, Hartford, Conn., for whom W. H. Jacobus & Co. are agents, 90 Chambers street, New York, of which an illustration is given in their advertisement on page 30, is \$12 per dozen, discount 40 per cent.

The manufacturers of Strap and J Hinges held a meeting in this city on the 21st and 22d inst., at which it was decided to continue the organization on the same basis as before. No change was made in prices. This arrangement has been working satisfactorily, and the gradual reduction of the stock of goods purchased at low prices, in the hands of the jobbers will give, it is expected increasing regularity to the market.

The principal manufacturers of Coil Chain have agreed upon uniform prices which are a slight advance on those previously made. An understanding was had in regard to freight allowances, and it was decided to sell the Chain at 30 days, with a discount of 1 per cent. for cash.

In view of the gradual withdrawal from the market, or at least the curtailment of their production, on the part of some of the smaller Screw manufacturers, it may be well for the larger companies to consider the

feasibility of coming to some agreement by which they will secure a better price for the goods. It would be to the interest of the trade at large if this leading line could be put on a staple basis.

Wrought Iron Butts are held without any open change in price, but some reported irregularities create a feeling of suspense as to the extent to which the other manufacturers will be disposed to meet these irregular prices.

The P. Hayden Saddlery Hardware Company, Columbus, Ohio, withdraw prices on Trace Chains, a line which is generally held at somewhat firmer quotations.

The prices of market Wire are slightly advanced, the figure at which it has been held having been for some time unprofitable.

Wrought Iron Pipe is held very firmly at previous quotations, and the meeting this week of the manufacturers is looked forward to with interest.

We understand that some outside manufacturer of Stove Hollow-Ware has been making some low prices, and that the associated manufacturers have taken action with a view to meeting this competition.

The manufacturers of Screw Hook and Strap and Heavy Welded Hook Hinges have been in conference, and have adopted uniform prices which embody a slight advance on previous quotations.

ITEMS.

The manufacturers of a leading specialty in the Gun line refer to the trouble they have in getting their Goods before the trade through the large Gun houses. Their policy has been to introduce through these channels, but they, in common with other manufacturers, have experienced a double difficulty. First, the jobbers are unwilling to take hold and to push energetically, finding it easier to confine their trade to the lines in which it has been running. There has been the further annoyance that the jobbers have shown a disposition to cut the price, thus injuring the manufacturer's market for the goods. It is intimated as not unlikely that an entirely different policy will be pursued before long, and that the large trade will be ignored.

The trade will observe the announcement made by Lovell, Tracy & Co., Hartford, Conn., in regard to their Axline, to which we have before directed attention, as put up in 1-pound square tin boxes, tastefully decorated in assorted colors, and designed for the Hardware trade, who can in this way put Axle Grease among their shelf goods.

The Spencer Repeating Arms Company, Windsor, Conn., and 290 Broadway, New York, issue a circular relating to their Spencer Repeating Shotgun, which gives an exceptionally full and satisfactory description of its mechanism and special features, together with a number of interesting testimonials from sportsmen as to their opinion of the Gun.

Our readers will observe among the Special Notices, on page 18, one in which Walter C. Wigham, 145 Broadway, New York, announces his desire for the agency for a line of goods which will not conflict with the manufacturers of the Home Rubber Company, Trenton, N. J., whom he is at present representing. Mr. Wigham, who makes a specialty of the railroad trade, to whom, as well as to other manufacturers, he desires to present the goods for which he is agent, is a young man highly recommended, and probably in a position to market satisfactorily a suitable line of goods.

O. H. Lubdorff & Co., St. Louis, Mo., manufacturers of the Vienna Metal Enamel and Rust Preventive, refer to the favor which this article has found with the Hardware and Stove trade. The directions for its use are that after cleaning the metal a thin coating be applied with cotton batting or a fine camel hair brush to prevent such metals as Silver Plated Ware, German Silver, Brass, Nickel, Polished Steel and Iron from oxidizing and rusting, whether exposed to damp air or touched by hand or water. It is put up in 2-ounce bottles, 1 dozen in a paper box, and is sold at \$2 per dozen, with a discount of 25 per cent. in lots of 1 gross or more.

Sargent & Greenleaf, Rochester, N. Y., expect soon to issue a new list and catalogue which will represent fully the various styles of Locks they are making, including their recent additions.

George B. Curtis, 96 Chambers street, New York, has been appointed by Joshua Britton & Son, Stoughton, Mass., sole agent for New York and Pennsylvania for the sale of Henry's Patent Combination Haft. It is intimated as not unlikely that this article may be made in other sizes, the principle on which it is made being regarded with some favor.

The Pratt Hardware Company, Buffalo, are occupying the large building on the corner of Washington and North Division streets, formerly occupied by Gies & Co. The president of the company, William H. Sherman, held for 24 years important positions in the well-known house of Pratt & Co., and has a wide acquaintance with manufacturers. The secretary, E. B. Pratt, was also connected with Pratt & Co. for 18 years, and the other members of the company, George A. Bush, treasurer; John W. Bush and James H. Smith, are well-known business men of that city.

Under date October 16 E. C. Meacham Arms Company, St. Louis, Mo., issue a 50-page catalogue, No. 359. It is devoted to Guns and Sporting Goods of all descriptions.

The Triumph Wringer Company, Keene, N. H., are sending out to their customers an attractive lithograph representing the Triumph Wringer in use.

Hibbard, Spencer, Bartlett & Co., Chicago, Ill., have sent out an elaborate catalogue of Silver Plated Hollow and Flat Ware, of which they make a specialty. It contains 64 pages filled with illustrations and descriptions, and forms a valuable and attractive book.

During a recent storm part of the roof of the Hart Hardware Company, Louisville, Ky., was blown off and thrown against one of the heavy skylights. The falling glass is stated to have done much damage to the handsome show cases below, but the work of repairing was begun immediately, and everything was promptly in as good order as before the accident.

The Iowa Farming Tool Company, Fort Madison, Iowa, allude to their business last year as having exceeded in dozens very heavily their largest previous year. They are prepared to meet the wants of the trade for their prize and Peerless Rakes and Iowa Weed Hoes, the sale of which last year they refer to as especially satisfactory.

George B. Curtis, 96 Chambers street, New York, is agent for Johnson's Improved Steel Wrench, and for a full line of Diagonal and S Wrenches, Baxter's pattern.

The United Opinion, of Bradford, Vt., gives in a recent issue an engraving of Henry A. Winship's Hardware establishment, of the arrangement of which we gave a description a few months ago, calling special attention to his Iron house, which is alluded to as a model in the way of utility and convenience. It traces Mr. Winship's mercantile career, from his clerkship with W. B. & C. S. Stevens in 1862 to his present extensive business, which is estimated at amounting the present year to \$100,000. Reference is made to the section of country from which his trade is drawn, and other matters of interest. Mr. Winship's characteristics as a business man is thus alluded to: "As a buyer Mr. Winship has few equals and no superiors. He thoroughly masters his business, knows every detail from practical education, is personally popular, painstaking and square, the secret of his enjoying the reputation by general consent of being at the head of the young business men of Orange County, Vt."

SHORTAGE IN TACKS.

The following letter from a manufacturer will be read with especial interest, going, as it does, with some detail, into the question, and illustrating the manner in which short weights are put on the market, with allusion also to a deterioration in the quality of goods.

In the interest of fair dealing we thank you for calling the attention of the trade to the very common practice of many manufacturers in our line of putting up their goods short weight, some of them very short indeed. The writer saw in Chicago last week what purported to be regular 1/2 weight 8-ounce Carpet Tacks. Each paper of the 12 should have weighed 2 ounces, but the aggregate weight was only 17 ounces per dozen papers, including the outer case or wrapper, thus making to the unscrupulous manufacturer a profit of nearly 30 per cent. over his honest competitor. Or, by dividing with the greedy buyer, he can still sell at 15 per cent. below the man with a conscience. The saddest feature in the case is that many dealers know full well just what they are buying and selling, thus conspiring to defraud the customer. A second source of profit to the very sharp manufacturer is the use of inferior material, by which he can save another 10 per cent. or 20 per cent. And a third, by the employment of unskillful workmen at low wages. Probably one of the most fruitful sources of the present chaos in the Tack trade is the large number of concerns who have recently embarked in the business (many of them unacquainted with it), and who really do not know what their goods are costing them.

The importance of the retailers taking hold of this matter and insisting on buying proper weights and paying only for such weights as they get is alluded to in the following letter:

We are aware that Tacks are being put up in light weights and sold for regular half-weights—the usual weight, unless marked otherwise—i. e., "1/2 weights," "full weights" or "2 oz."—and believe such putting is a potent reason for the present ruinous prices at which Tacks are being sold. Not a package of the goods of our manufacture has ever been put up weighing a fraction less than the package indicated. Of course in time the consumers will rebel and require the quantity which they pay for. Then the trade will insist upon having fair weights, but so long as the dealer can buy goods of two-thirds the proper weight at a less price, and dispose of them at same prices as they could obtain for regular weights, there is not much hope for any immediate reform in packing by those who are putting up "short weight" goods.

The policy of one of the newer companies, who are following a conservative course in regard to Tacks, is referred to in the following letter, as well as the prevalence of the light and irregular weights which are under consideration:

The class of trade we have been cultivating is that which is willing to pay a little more for better goods. We hear of low prices—in fact, below cost—every day on

Tacks, but we pass them by, as we prefer to keep our goods rather than sell at a loss. We have often found goods that would count and weigh 10 to 20 per cent. less than ours, and of course they can be sold cheaper, but we will not pack in this way. Eight-ounce Carpet Tacks can be bought to-day less than 3d. Fine Nails per pound—that is, provided they are put up honest weight and sold at quotations made. Such a state of things cannot last long, and it does seem, with Tack Plate and most kinds of Iron and Steel stiffening in price, that if manufacturers were not foolish an advance on Tacks might be made and maintained.

The communication given below is from a leading Tack company, and alludes, it will be observed, to the prevalence of the practice in question, the irregularity of existing quotations and the importance to the manufacturer of establishing and maintaining his reputation:

We have been aware for more than two months that Tacks were being put up light weight, and we think this has considerable to do with the extreme quotations on Tacks in some quarters, while other parties are so demoralized thereby that they will make a large loss on Tacks rather than be apparently undersold. We find the price on our make of goods fully 10 per cent. higher than many quotations in the market; in some cases more than 10 per cent. Up to this time we have put up no Tacks other than regular full half and quarter weights, full as represented, and we do not believe any manufacturer can afford to shade his weights on Tacks or anything else. A manufacturer's reputation is worth more to him than what he would be likely to make or lose in his business in one year. We speak of the worth of a manufacturer's reputation to him in dollars and cents. This is aside and beyond the true worth of the character of the man.

Another correspondent in the letter given below gives an illustration of the extent of the shortage which, in his observation, is frequently experienced. In connection with the reference to the extremely low prices prevailing he remarks:

Many of the manufacturers are putting up their goods in light weight. Most of them average 20 ounces instead of 24 ounces in 8-ounce quarter-weight Carpet Tacks. This is owing to the extreme quotations.

A concern which was not in the combination writes as follows in regard to the matter:

We know that some parties are putting up Tacks with light weights and giving extremely low quotations. Some of these at least are making poor Tacks also. We know of a lot that were sent here upon an order; we saw samples of them, and they were positively the poorest Tacks we ever saw. They were all lengths, all sized heads, some of the Tacks were split open, and looked as though they were made of cheap Hoop Iron. It is against such parties as these that we must meet competition, but we do not do it in price, however. We are getting 20 per cent. more for our goods than these parties quote, and are running full. We understand that most manufacturers making a better class of goods and who are caring anything for their reputation are not meeting the lowest quotations.

Another manufacturer briefly refers to the matter in this way:

I have no doubt that Tacks are being and have been sold in large quantities as stated. I am a sufferer from this cause, as all good-bearing my labels have been exact weight, no deduction having been made even for boxes. It ought to be prevented if possible, and all adopt a uniform standard.

A prominent concern, referring to the practice in question, says, it will be observed, a passing tribute to the late combination. One of the good results of which was the giving of uniform weights:

Of our own knowledge we cannot say that short and irregular weights are now put up, but our presumption has been very strong that such would be the case, knowing, as we do, the custom of some manufacturers prior to the forming of the late lamented Central Mfg. Company. It is, in fact, the only method by which such manufacturers can hope to make ends meet under the present era of very low prices, and therefore, in our judgment, is one of the causes for the extreme quotations to which you make reference. For ourselves, we say that when the time comes when choice must be made between the making of irregular weight goods and the closing of our Tack business we shall adopt the latter.

The following letter refers to another result of the demoralization in the price of Tacks, the putting of inferior goods on the market:

We notice what you say in regard to short weights in Tacks. Some factories not only put up short weights, but put lead on the Tacks instead of tin, a practice which is injurious to the trade. Discount 75 per cent. from the list is all any factory can afford on good, honest weights and well-tinned goods. The practice referred to is the cause of such low quotations as are made by some factories, and is injurious to the business.

Another Tack concern, in a letter written previous to our last issue, refer to the subject as follows:

We read with considerable interest the article in *The Iron Age* regarding short weights of Tacks, although we have no authentic information of any one packing in the manner named. We have heard rumors of it, and expect either that it has been done by some parties so as to come out whole at the extreme quotations, or that they have been selling at a loss. We beg to say for ourselves that we have adhered at all times to standard weights.

We have heard from a number of retailers in regard to the putting up of short weights, and the matter is evidently regarded by the

trade as of some interest. A Hardware merchant writing from Pennsylvania thus refers to the practice:

There is no doubt that the putting up of Tacks in short and irregular weights is practiced to a considerable extent, and has interfered somewhat with prices, but think it has been more encouraged by the "bargain houses" who furnish goods to persons having 5-cent stores and counters. Of course we have to keep them in stock to show to our customers what kind of goods they buy when they get two papers for 5 cents retail, and in some cases three papers. We never have any trouble to sell the regular goods at a fair profit, and always specify the kind we want when we buy. If all dealers would only do the same there would be very little sale for light weights. I have had some one-quarter weights sent me where the package containing them weighed as much as the Tacks.

COAL REGION.
Another Hardware house in Pennsylvania allude as follows to their experience in the matter. There are, however, indications from other sources that the practice in question is not confined to the small concerns:

We do not think reputable Tack manufacturers have been doing much in short count and weight goods. Our experience in goods of this class has been with the small makers, offering inducements in price to secure orders in every instance.

The following letter is from a Hardware merchant in Connecticut, and indicates something of the extent to which Tacks are put up short, and may be suggestive to other retailers:

The extremely low prices at which I have been offered Cut and Carpet Tacks by drummers led me to ask the question, Are they up to the standard in weight? and in only one instance I was answered in the affirmative. It is my opinion that Cut and Carpet Tacks are put up short weight to a considerable extent. I would not put into my stock packages that I know to be short, or purchase of any manufacturers guilty of such a practice, and sincerely believe that those who do will be the losers in the long run.

As illustrating the different experiences of the trade, large and small, in different parts of the country, we make also the following extracts from letters recently received. Some of our correspondents, it will be observed, have not as yet met with these short weight Tacks. It may be, however, that some of the trade are assuming that the Tacks they are handling are of regular weight and count, without having subjected the goods to a careful examination:

Vermont.—We have always sold honest weight Tacks and know but little about the short weight movement. We are decidedly in favor of the honest method of putting up Tacks and all other goods, believing it in the long run to be for the interest of the manufacturers and dealers, as it certainly is for the consumer, who is the one to suffer in the end, for we do not believe that in any case he gets a reduction in price in consequence of light weight packages.

Ohio.—Tacks are nearly all put up short weight at present, and the practice causes a good deal of complaint from the trade.

South Carolina.—We have received none of the short weight packages of Tacks so far. The effect of such a practice will be to demoralize prices and trade.

Pennsylvania.—I have never had any trouble with Tacks, but have heard of them being put up short weight by some houses. I do not think that any responsible house would stoop to such a practice.

Vermont.—I buy all my Tacks of —, and have never seen or had offered me any light weight goods, such as are referred to. My traveling man says he has seen a few lots of the goods, and thinks that parties buying did not as a rule understand what they were getting.

Ohio.—I have never noticed any short or irregular weights in Tacks, and have purchased at very low prices.

A Hardwareman in Ohio refers as follows to the Tack business, and the trade will observe the severe terms with which he characterizes the mischievous and dishonest practice:

The Tack subject comes to us frequently, and in an unpleasant way. A retailer takes some reasonable pride in selling to a man that which he pays for. Some time ago we bought through a jobber 10 cases of Tacks, labeled by a very reputable maker and an old house. At that time we compared them with other quarter weights and found them sadly wanting. We did not buy them of the maker, and could not return them to the jobber, who bought them in good faith. We have since been selling our customers these false pretenses—telling them, with a gentle smile, that the Tack business was a swindle of which we both were the victims. Since noticing the articles in *The Iron Age* on the subject we have gone through several makes and find the shortage pretty general. It is an outrage on the jobber and a positive damage to the retailer, who, if it keeps up, will be compelled to sell from bulk to be half respectable. Push your *Iron Age* articles against such manufacturers, and help jobbers and retailers to make a stand against the palpable robber, and oblige one of very many retailers.

WHAT THE TRADE SAYS.
Referring to the manner in which Wire Nails are put up, a correspondent writes as follows, with suggestions which may be of service to some of the manufacturers:

Why do not the manufacturers of Wire Nails get more suitable packages? In most of those which I have bought the packages were too large for the Nails, a pound in some cases only half filling the package. Some manufacturer who would put up the smaller sizes, say from 1 1/2 inches and under, in half pounds, would find a more ready sale for the goods, and dealers would be willing to pay a slight advance to cover the cost of packing, &c.

Under the amended charter of the Chicago, Kansas and Western Railway that company and associated corporations will have a fixed capital stock of \$154,000,000 and operate more than 7000 miles of road.

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PATENT Screw Wrenches
 MANUFACTURED BY
L. COES & CO.,
 Worcester, Mass.
 ESTABLISHED IN 1839.




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 Straight Bar, Extra LONG NUT FOR SCREW IN JAW.

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Finished in Carmine, Black and Gold.

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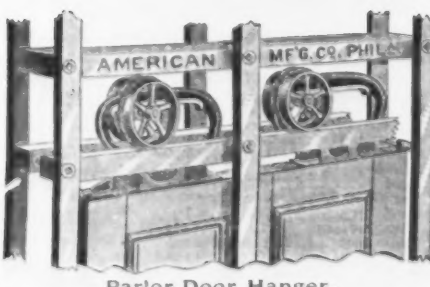


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Sliding Door Hangers,

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 CHALK LINES, &c.
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 HARDWARE CO.,**
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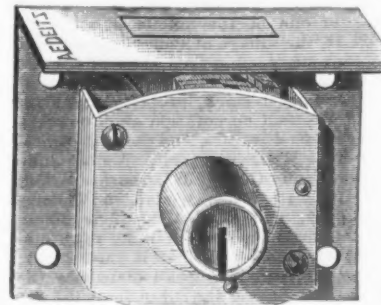
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 Well Advertised,
 Sells Quick and
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 The attention of Hematite ore miners is called
 to our new Jig. The simplest and most effective
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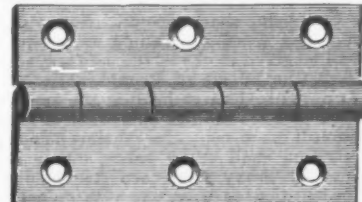
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No. 51 Lock.

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Factory, BROOKLYN, F. D., N. Y.



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ALWAYS GIVES THE
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Main Belting Co.
 Manufacturers of
**THE LEVIATHAN
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 BELTING.**

Unsurpassed for
 Strength, Durability and
 Cheapness.
 Made to any Length,
 Width and Strength
 Main Driving Belts.
 Guaranteed to Run
 straight, Even Through
 out.
 No Cross Joints, Un-
 affected by Damp.
 Clings well to the Pulley.
 Has no equal. In fact,
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THE CHAMPION LEVER BLOWERS & FORGES

Are the Leaders of the World.

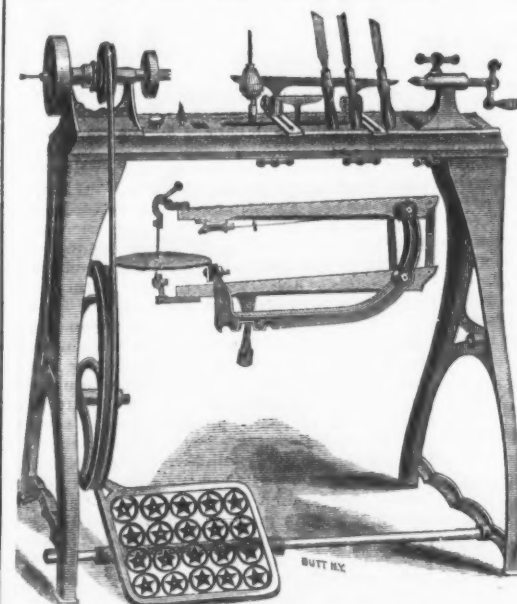


CHAMPION BLOWER & FORGE CO.,
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WHITE MOUNTAIN FREEZER.



AXLEINE
 is a fine quality of Axle Grease, put up in square
 tin boxes containing one pound, beautifully de-
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 the Hardware Trade. Showy and attractive shelf
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Many kinds of Scroll Saws have
 been put on the market by our-
 selves and other manufacturers
 during the past twelve years. Of
 these only a few have proved good
 enough to remain in demand. The
 call now is for a well-made, prac-
 tical machine, and all second-class
 ones are of slow sale.
 Those who want a good Lathe
 with Scroll-Sawing Attachment and
 all Tools and Improvements to the
 very latest moment will buy the
 Goodsell Lathe.
 Those who want only a Scroll Saw
 with Drilling Attachment, Rubber
 Blower and Lever Clamp will pre-
 fer the Rogers Saw.
 These two machines are taking
 the place of all others and are now
 the most in demand throughout the
 world.
 No dealer can make a mistake by
 laying in a stock of them. About
 Christmas time they are wanted
 in every town, and will make busi-
 ness lively at this otherwise dull
 season.
 We also keep a full stock of
 Designs, Wood, and all other Scroll
 Sawing goods.

Price of Goodsell Lathe
 complete, \$12.00.

Price of Rogers' Saw,
 complete, \$3.50.

MILLERS FALLS CO.,

74 Chambers Street, New York.

CHAMPLAIN
 Forged Horse Nails.
 MANUFACTURED BY THE
NATIONAL HORSE NAIL CO.,
 Vergennes, Vermont.
 HOT FORGED AND COLD HAMMERED POINTED MADE OF BEST
 NORWAY IRON AND WARRANTED.
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THE SEIDEL & HASTINGS CO.

WILMINGTON, DELAWARE,

New York Office, No. 221 Pearl, Corner Platt Street.

MANUFACTURERS OF
**BEST CHARCOAL
 BOILER PLATES,**
 AND PLATE IRON GENERALLY.

ALSO BEST QUALITY HOMOGENEOUS STEEL PLATES.

We ask the special attention of the trade to our C. H. No. 1 Boiler Plates, which we
 manufacture expressly for the Shells of Steam Boilers and stamp \$50.00 per square foot. When
 desired. One hundred and sixteen tests of this iron, made during the last three years by the
 U. S. Inspectors of Steam Vessels, show an average tensile strength of 58,808
 pounds to the sectional square inch, and an average reduction of area of the fractured
 section of 30% per centum. Our prices are as low as the production of a good article will admit of.

POTTSVILLE IRON & STEEL CO.,
 POTTSVILLE, PA., Manufacturers of all kinds of

STRUCTURAL STEEL AND IRON

Viz., BEAMS, CHANNELS, TEES, ANGLES, PLATES AND BARS; Also STEEL
 AND IRON AXLES FOR FREIGHT AND PASSENGER CARS.

This Steel is manufactured by the CLAPP-GRIFFITHS process, and is specially adapted, in
 addition to the above, for Boiler and Bridge Rivets, Wire Rods, Nail Plates, &c. &c. Our Mill Steel
 is well adapted for use in place of the best quality of Wrought Iron; where a greater strength
 and ductility is required, it welds readily as Iron. Also Billets, Slabs of all sizes and any desired
 temper. Shaping of all sizes in stock, from which prompt shipments can be made.

Brewery, Malt and Ice House Construction a Specialty.

**Hermann-Parker
 Hardware Mfg. Co.,**

MANUFACTURERS OF

GREY IRON SHELF HARDWARE.

Our Specialties: Axle Pulleys, Well Wheels, Grind-
 stone Fixtures, Hay-fork Pulleys, Wash-boiler
 Handles, Store Lifters and Post Mauls.

Works: 11th and Papin and 12th and Gratiot Streets, St. Louis.

PURE TURKISH EMERY.

WALPOLE EMERY MILLS,

South Walpole, Mass.

MECHANICAL.

The Compound Steam Engine.

Mr. J. Richardson, in his paper on "The Compound Steam Engine," read at the recent meeting of the British Association, stated that, though there is no theoretical limit to the economy to be obtained by extremely high degrees of expansion, yet there are practical limits which are soon reached for non-condensing engines. In these the steam must not be expanded below the atmospheric pressure, or back pressure and waste of power are the result. To prevent this a very high initial pressure must be used, and, as with 140-pound boiler pressure or 155-pound absolute, steam expanded 10 times leaves only $\frac{1}{2}$ pound pressure in the exhaust, this is fixed upon as practically the most useful degree in non-condensing engines. Reference was made to the use of steam at much higher pressures—500 pounds and upward—and used in three or more cylinders, yet the difficulties attending the production of steam at these high pressures and temperatures, and the maintenance of the working parts of the steam cylinders, were stated to be such as more than counterbalance the advantages to be obtained from their use. While it could be shown that expansion could be carried to such an extent that while the efficiency of the steam, considered merely as steam, would continue to be increased, yet a point would be reached when it would be barely able to move the piston it was intended to propel, and when, therefore, the engine in which it worked would be practically useless. A comparison was instituted between the single-cylinder expansive engine and the various classes of compound, namely, those which have the low-pressure cylinder parallel with the high, as in the Woolf engine, on the same center line, as in the tandem, and those with cranks at right angles, the advantages and disadvantages of each type being pointed out. The proportions to be maintained between the cylinders were next considered, and the advantages of the intermediate receiver and heater were referred to; the advantage of expansion gear to the low-pressure cylinder, not merely for the purpose of securing greater economy, but also for the sake of securing uniform distribution of the load between the two cylinders, was pointed out.

Illustrations and diagrams of the earlier types of engines were given, and indicator diagrams showing different methods of distributing steam, together with large diagrams showing modern tandem compound horizontal engine, coupled compound horizontal and coupled compound with locomotive boiler combined, as well as details of the valve gear of each and the method of automatically regulating the supply of steam. The compound engine as now constructed was claimed to be the most perfect form of steam motor, comparatively small engines under 100 horse-power and without condensation giving a horse-power for somewhat under 20 pounds of steam per hour, while large engines when fitted with condensers have been shown to use no more than 12 pounds of steam per horse-power per hour; at the same time the construction of compound engines has been so simplified that they have no more parts, and are no more difficult to manage, than ordinary double-cylinder high-pressure engines.

An Old German Pumping Engine.

A recent issue of the *Zeitschrift des Vereins Deutscher Ingenieure* contained an interesting account of the first steam engine built in Germany, and probably the first machine of the kind ever seen in that country. It was erected from the designs of Bergassessor Buckling, who had been deputed to visit England for the purpose of studying the best examples to be found, and it was first set to work at the König Friedrich Mine, near Hettstadt, Thuringia, on August 23, 1785. It was single-acting, the cylinder having a diameter of 23 inches, and the valves worked by a plug frame suspended from a huge beam provided with arch-heads in the manner usual at that period. It was, in fact, a very close copy of the Watt type of engine then prevailing. The machine does not seem to have been a success, for the boiler gave way and the engine came to a standstill. On investigating matters a "mountain 20 inches high" was discovered inside the boiler, the feed-water being of a highly calcareous nature. A new boiler was accordingly provided, but still this engine could not keep the water down. Buckling was again dispatched to England, and a larger cylinder of 34 inches diameter was ordered at Hornfay's foundry, at Penydarnan, the scene of Trevithick's early experiments. But, what was of more importance than a new cylinder, Buckling succeeded in obtaining the services of an experienced engineer named Richard, whose engagement was a matter of the greatest difficulty, the laws against the enticing of skilled artisans abroad being then in full force. With Richard's help, the engine was reconstructed and remained at work until 1794, when it was taken down, to be removed in 1797 to the Hoffnung Mine, at Lobejun, where it did duty until 1848. Richard seems to have remained permanently in the Prussian service and to have erected other engines at various mines. A large folding plate is appended to the paper in the *Zeitschrift*, giving a general view of the engine from a drawing made by Carl Eckardt in 1797—that is, subsequent to its removal—together with a number of details to scale. These latter sketches were taken by Friedrich Fricke in 1794, no doubt when the engine was taken down. We hand these names down to posterity in gratitude to the draftsman for having preserved with so much exactness the particulars of almost every part of a pumping engine of the last century.

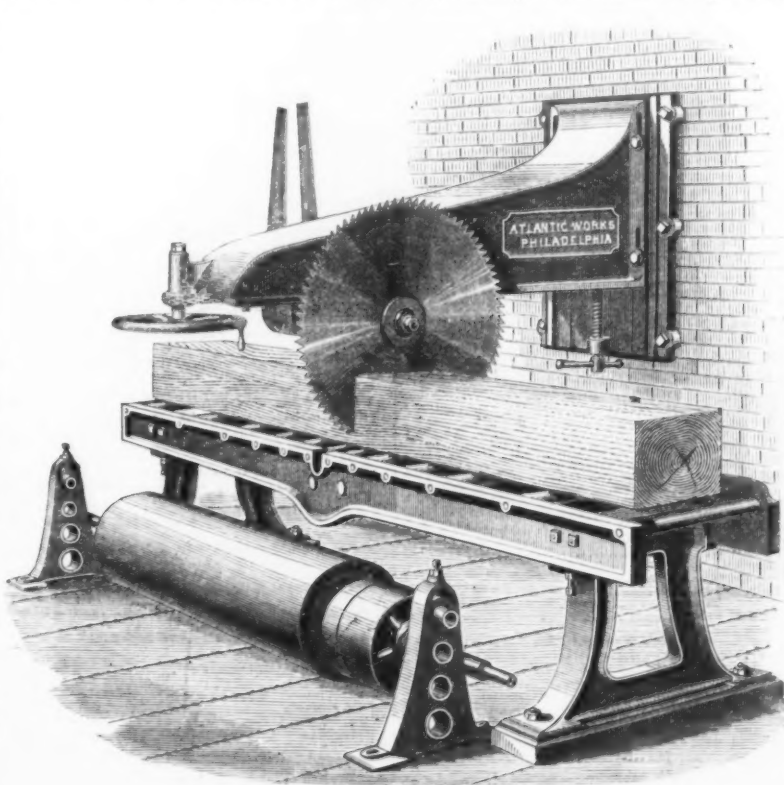
Vulcanizing Rubber Belting.

In the manufacture of rubber belting composed of cotton duck coated with a thin tissue layer of rubber the method usually practised in curing or vulcanizing the rubber is to place the belting after an outer wrapping of thin rubber has been put on between a pair of hot plates or boxes heated by steam and subject the same to hydraulic

pressure to press the belt to an even thickness. These presses are made some 20 feet long, and are composed either of one long complete press, or of one or more short ones, set at such a distance as to vulcanize alternate squares. The belting is subjected to a fixed temperature a certain length of time, according to the material to be vulcanized. In subjecting the belting to this process it is necessary to have a longitudinal strain upon it before pressure is applied to prevent buckling, and to stretch the same in such a manner that the threads of the inner cotton fabric shall be kept straight, so as to produce a permanent set to be maintained in use. The usual method of accomplishing this has been by locating clamps at each end to grip the belting and geared leverage to effect the stretching. By such means the operator could put the necessary strain as required, neither to overstrain nor leave it slack. An improvement on this was to make the geared apparatus a part of the vulcanizing structure, so that there should be a minimum wastage at each end, the belting being clamped quite close to the presses. This was covered by a patent to John Murphy in 1879.

Bracket Cut-Off Saw.

London, Berry & Orton (Atlantic Works), of Philadelphia, are putting on the market the bracket cut-off saw which we illustrate



BRACKET CUT-OFF SAW.

Built by the Atlantic Works, Philadelphia, Pa.

in the accompanying engraving. It will be observed that the frame that holds the saw and mandrel is bolted to a plate on which it has an adjustment for wear of saw, and that plate is bolted to a wall or timbers set up for that purpose. The saw is fed by hand. The carriage is 10 feet long and supplied with wrought-iron rolls, so that heavy timbers can be easily handled. The saw is bolted from above. For heavy long timber the saw is claimed to possess special advantages. A 40-inch saw will cut 16 inches thick.

Fire Tests for Lubricating Oils.

In a paper on the general subject of lubricating oils, recently presented to the Liverpool (England) Engineering Society, Professor Hele-Shaw refers as follows to the fire test: The effect of heat on the nature of a lubricant must not be confounded with the effect of a rise of temperature on frictional resistance. The application of heat is important rather in connection with mineral oils, which vaporize, and compounds into which mineral oils largely enter than with animal and vegetable oils, which thicken and decompose. There are two points for consideration in connection with the former class oils, one being the amount of evaporation taking place at temperatures not exceeding the boiling point of water, the other the actual point at which the ignition of the vapor given off takes place. It has been stated that, though many oils considered good lost 5 per cent., and one or two samples 10 per cent., in a 10-hours test at 212° F., yet, on the other hand, many oils lost nothing at all. The second point is, however, much more important, and there are strong reasons for attributing several recent conflagrations, and consequent destruction of mills, to the ignition of the lubricants used in them. The "fire test" thus becomes an important one. There are several pieces of apparatus for the purpose, the principle of them all being simply to heat the oil until the vapor given off ignites on the application of a light, the temperature of ignition or "flash point" being observed by means of a thermometer. The nearest instrument for the purpose is that of Bailey, in which the oil is heated in a copper vessel about three-quarters full, the vapor from which, issuing laterally, comes in contact with the flame of the heating lamp or Bunsen burner. This is a more satisfactory arrangement than the application at intervals of a light to the orifice. There are many oils which flash at 180° F., some at 150° F.; but an oil should never be used for lubricating purposes which flashes at a point below 250° F., some of the best mineral oils vaporizing at 600° F. The gumming and drying properties of oils may be simply tested by allowing samples to flow down an inclined plane, when the nature of the oil becomes manifest; sometimes, if a bad specimen, after an hour or two, and sometimes after a day or so, the best oils remaining liquid, and continuing to flow down even after several days. This is

the mode in which the Swiss watch oils are tested. Mr. Bailey has contrived for this purpose a convenient arrangement consisting of a box filled with water, and having an inclined sheet glass top; the water is kept at 200° F., and the behavior of a given small quantity of oil placed on the surface of the glass is noted. There are other modes of physical tests, but of sufficient practical importance to demand consideration.

Sugar as an Anti-Incrustator in Steam Boilers.

According to *Engineering* the last number of the *Rivista di Artiglieria e Genio* contains a brief but important article by Col. Agostino Polto, of the Italian engineers, giving the result of certain experiments carried out by him with common sugar as a remedy for preventing incrustation in boilers. After what has already been said on this subject the results of further practical test cannot but be of general interest. The account before us states that the boiler made use of by Colonel Polto was a 20-horse-power Field tubular boiler containing 126 tubes. This boiler was ordinarily scraped and cleaned out every 45 days (i. e., after 350 working hours), when the average weight of scale removed, after making use of the best methods known for preventing incrustation, amounted to 12 kg. Before

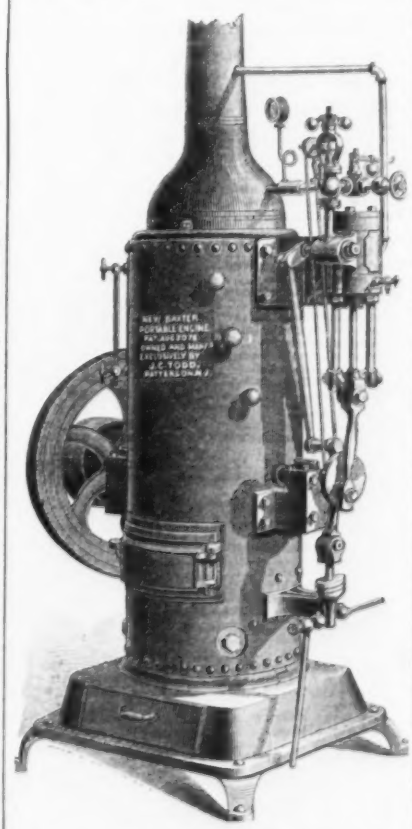
used 10 hours per day, the supply for 600 inhabitants. For an actual horse-power necessary to drive a printing press or other machine a quantity of water sufficient to supply from 1200 to 2500 persons will be required—that is, if the said machine is driven 10 hours per day. Can cities afford to furnish such a supply, and more particularly so where the water is pumped? For, for every horse-power distributed to various parts of a city through small pipes, valves and abrupt turns, at least 2 horse-power are expended at the pumping station. There are other obstacles that cannot be overcome. Where the water is taken from a lake, as it is at Chicago and Milwaukee, the city authorities have control, but in most cases the supply is taken from rivers, ponds or lakes owned by manufacturing companies, and though such water may be taken for domestic purposes, not one drop would be allowed to be rented for power. There are exceptional cases where cities acquire the entire supply in anticipation of increased population, and for the time being there is a surplus that may be used for power instead of running to waste. In such cases a simple turbine or impact wheel will be found by far the most economical in first cost and use of water. It will be desirable, however, to place them where their humming will not become unpleasant.

Open vs. Close Couplings for Railroad Cars.

Some very interesting experiments have been made in this country to test the effect of open and close couplings upon the ability of a locomotive to start a train. This has been a matter of hot dispute for a good while, and it is strange that the matter was not long ago determined by actual experiments. At Burlington it was found that the locomotive could start level 49 loaded cars close coupled and 48 with ordinary link and pin coupling. Afterward on the grade the engine started 38 cars with each method of coupling. The general results seem to establish the conclusion that the loose slack of open couplings is of no advantage in starting a long and heavy train, and that the draw-bar springs give all the slack that is needed. This, according to the *London Engineer*, is opposed to the results of English experience, which show that slack in the couplings is essential to the starting of heavy trains. How much slack is an open question.

The New Baxter Engine.

We show in the annexed cut the new Baxter portable engine built by J. C. Todd, of Paterson, N. J. We need not point out the differences in general appearance between this and the well-known older form of Baxter engine, as they are at once apparent from the illustration. The boiler, however, in this case is made of wrought iron, and the sizes of the engine range between 1 and 12 horse power. The engines are supplied



The New Baxter Engine, Built by J. C. Todd, New York.

with Judson's governors, and have improved feed-water heaters. Each engine is tested before leaving the works. The New York office of the builder is at 36 Day street.

Cruisers for the French Navy.—In accordance with the decision of the French naval secretary, two first-class cruisers are about to be put on the stocks, one at Brest and the other at Rochefort. These ships will be built of steel, and furnished with barbettes towers; they are to be 353 feet 4 inches long, 43 feet 7 inches wide, 18 feet 10 inches deep, and measure 4160 tons each. The armament is to consist of four guns of 6.3 inches, six of 5.5 inches, 10 revolver guns and four tubes for throwing out torpedoes. Their speed is to be 19 knots per hour. The cruiser to be built at Brest is to be called Dupuy de Lôme, and the one to be built at Rochefort Jean-Bart.

Mr. M. N. Forney, C. E., has purchased and is about to consolidate under his editorial management Van Nostrand's *Engineering Magazine* and the *American Railroad Journal*, the publication to be hereafter known as the *American Engineering Magazine and Railroad Journal*.

The seventh annual meeting of the United States Association of Charcoal Iron Workers has been postponed to November 9, at Philadelphia.

TRADE PUBLICATIONS.

Steam Traps, Pressure Regulators, &c.

The Curtis Regulator Company, 59 Beverly street, Boston, Mass., have just sent us a number of interesting little circulars devoted to their several specialties in the steam line. Among them we find several on the Curtis steam traps; another on the Curtis pressure regulator, an improved swinging check-valve and the Curtis damper regulator. All the devices are illustrated and brief descriptions are given.

General Machinery and Steam Heating.

The Exeter Machine Works, of Exeter, N. H., have just sent us four very interesting catalogues. One of them is devoted to the Exeter steam engine, another to blowers and exhausters and the two others to steam for heating. The first describes the Exeter engine in a general way with the use of neatly executed engravings. A list of horse-powers, together with dimensions and revolutions, &c., is also given for the convenience of intending purchasers. The catalogue on blowers and exhausters shows a number of different types of these machines, together with information on counter shafts and pulleys, hot-blast steam-heating apparatus, &c. The two books on steam heating are of special interest, and, aside from the engravings which they contain, showing practical applications of the Exeter system, they will be found to contain a large amount of practical information on steam heating in general.

The May Reverse Lever Latch for Locomotives.

In an interesting little pamphlet just issued by Messrs. Whittlesby & Wright, of Washington, D. C., we find illustrations and descriptions of a new reverse lever latch for locomotives, invented by Mr. Charles May, road foreman of engines of the Sunbury Division of the Pennsylvania Railroad. The shortcomings of the ordinary quadrant in locomotive practice are sufficiently well known to make it unnecessary to refer to them here in detail, and we need briefly say that Mr. May has attempted to overcome them and to produce a device which will admit of much closer regulation. The manner in which he has accomplished this object is thoroughly set forth in the pamphlet before us, and its examination will prove alike interesting and profitable.

Machine Supplies.

Mr. James M. Everhart, of the Scranton Brass and File Works, Scranton, Pa., has sent us two circulars devoted to his specialties for manufacturers and coal and iron miners. One of the circulars is devoted to illustrations of a pneumatic signal gong, surveyors' compasses, headlights, safety lamps, water, gas and steam cocks and other appliances, while the second circular furnishes a brief description of an exhaust-steam injector. Sectional and general views are given of this device, and its improvements are pointed out in an interesting manner. Price lists and tables of sizes are attached.

Fuel Water Gas at Troy, N. Y.

The Troy Fuel Gas Company are now engaged in extending their line of mains, and will have before winter sets in a very much larger territory to supply. Those now contracted for are largest 20 inches and smallest 8 inches, with all the intermediate sizes. In order to meet the increased demand that will result from these extensions contracts have been let for the erection of a holder of large dimensions, together with a new Lowe apparatus capable of making 1,000,000 cubic feet per day, to be followed with still larger apparatus capable of making 5,000,000 cubic feet per day; and assurances from those now using and others wanting to take the fuel gas are ample that the Troy company will find consumers for all the gas their new plant will be capable of turning out.

The new generating apparatus and holder are being erected on an extensive property just acquired by the Troy Company. The lot is 600 x 130, and contains a large and substantial brick structure, 250 x 80 feet, 50 feet high, entirely suited to the purpose of the new owners. The present holder under contract will enable the company to deliver from 1,000,000 to 2,000,000 cubic feet per day, and will give a pressure of between 5 and 9 inches. During the coming winter, or until the new apparatus can be put in position, the manufacture of gas will be continued at the present station on River street until the larger apparatus is erected at the new station. Pipes leading to the new holder at the new works will carry the gas to that point, from where it will be distributed through the general system of street mains.

The Citizens' Company, of Lynn, Mass., another of the Lowe fuel water-gas plants, have been making surveys and all preparations for extensions, which will be pushed with all vigor. This plant was erected some time ago, and has not been in full operation, owing to the lack of a law permitting the operation of fuel gas works, but now that a law has been enacted covering this field there is nothing to prevent the thorough introduction of fuel gas in Lynn, although quite a goodly number of consumers have been using the gas for various purposes for three years, paying the usual price, 50 cents per 1000 feet.

in's Applewood Handles.....	¶ doz \$6.00, doz 10 in in's Rosewood or Cocobolo.....	¶ doz \$2.00, doz 40
nives.....		
n's Patcher Knives.....	dis 25 @ 30 c	
n's Butter Knives.....	dis 25 @	
old' Butcher Knives.....	dis 25 @	
a Shoe Knives.....	dis 20 @ 25 c	
s Bread Knives.....	¶ doz EL \$0, dis 15 @ 20 c	
n's Knife.....	dis 20 @	
ell Co., Butcher, Shoe, Bread.....	dis 20 @	
and Straw.....	See Hay Knife	
and Pocket.....	See Cutlery	
obs.....		
Mineral.....	. . . 85c doz	
Por. Jap'd.....	75c 8 doz	
Por. Plain.....	7c 70 @ \$3.00	
Por. Plaid.....	7c 75 @ 40	
Bette Door Knobs, new lat.....	dis 35 @ 40 c	
& Tarnie Wood Knobs, list Dec. 1888.....	dis 10 @	
tute, Wood screws.....	The gross net at 10 c	
Rubber Tip.....	dis 70 @ 10 1/2 c	
Ree, Judd's.....	dis 60 @ 10 1/2 c	
re, S.....	dis 60 @ 11 1/2 c	
re, Bernacchi.....	dis 60 @ 11 1/2 c	
re, Porcelain.....	dis 60 @ 11	

Ties, Hais.ds 50&10 2
Timbers' shears, &c.ds 20 25 5
Shears and Snips (S. & W.).ds 20 25 5
Punchesds 33 34 5
Scute Wallstons Co.ds 33 34 5
Tiware
Stamped, Japanned and Pileed, Cen-
tral Stamping Co., list June 1, 1895.
.....ds 25&32 a - c Extra same
Pileed, S. S. & Co.ds 33 34 5
Times given.
Stamped S. S. & Co.ds 33 34 5
Tobacco Cutters.
Caterpillar, Mfg. Co., Champion,ds 70&10 10 30 5
Wood bottom 70&10 10 30 5
Ad Iron 70&10 10 30 5
Sawback, Lock Co., 70&10 10 30 5
W. H. Son's 70&10 10 30 5
"Hopper (Sargent & Co.) 70&10 10 30 5
Acme 70&10 10 30 5
Tramson Litters.
Wollensack's Patent Iron Bronzed.ds 50 5
Reber's Improved Self-Locking (Class 201).ds 40 5
Reber's Improved Self-Locking (Class 201).ds 40 5
Reber's (Class 101).ds 50&10 10
Excelsior.ds 50&10 10
Shaw'sds 50&10 10
Payson's Universal.ds 40 5
Crown and Star.ds 50 5
Traps.
Newhouse.ds 30 5 40 5
Scribble's Patent.ds 10&10 10 20 5
Game, Blake's Patent.ds 30 5
Mouse and Rat.
Mouse, Wood, Choker. 70&10 10 30 5
To do 70&10 10 30 5
Mouse, Game, Wire 70&10 10 30 5
Mouse, Catch 'em alive 70&10 10 30 5
Mouse, Bonanza 70&10 10 30 5
Mouse Delusion. 70&10 10 30 5
Rat, "Decoy" 70&10 10 30 5
Shaw's 70&10 10 30 5
Cyclone 70&10 10 30 5
Truvels
Reber's Brick and Plasteringds 30 5 30&5 5
Reed's Brick and Plasteringds 15 5
Disston's Brick and Plastering.ds 20&10 10 20&10 5
Reber's Plasteringds 30 5
Clement & Maynard'sds 20 5
Reber's Brickds 10 5 20 5
Reber's Plasteringds 30 5
Worral's Brick and Plastering.ds 20 5
Gardends 20 5
Buried and Chemo.ds 25 5
Tucks, Warehouse, &c.
Fenfield Hosiery Co., list 1895.ds 40 5
Twine, Boiler—See Pipe.ds 40 5
Twine.ds 40 5
No. 9, Flax Twine, 3/4 and 5/8 Balls 22 5 30 5
To do 22 5 30 5
No. 10, 3/4 and 5/8 Balls 22 5 30 5
No. 12, 3/4 and 5/8 Balls 22 5 30 5
No. 14, 3/4 and 5/8 Balls 22 5 30 5
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No. 18, 3/4 and 5/8 Balls 22 5 30 5
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No. 198, 3/4 and 5/8 Balls 22 5 30 5
No. 200, 3/4 and 5/8 Balls 22

WHOLESALE METAL PRICES, October 27, 1886.

METALS.

IRON.—Duty: Bars, 8-10¢ to 11-10¢ per lb.; provided that no iron shall pay a less rate of duty than 35¢. Sheet, 11-0¢ to 15-10¢ per lb. Band, Hoop and Scoll, 14 to 14-10¢ per lb. Railroad Bars weighing more than 25 lb. per yard, 7-10¢ of 1¢ per lb.

Standard American Pig Iron.

Foundry No. 1 X..... ton \$18.50 @ 19.00
Foundry No. 2 X..... ton 17.25 @ 17.50
Gray Forge..... ton 16.00 @ 16.50

No. 1 Scotch Pig Iron.

Carnegie..... ton \$19.00 @ 19.25
Coltess..... ton 20.00 @ 20.25
Shotts..... ton 18.75 @ 19.00
Glenbrook..... ton 19.25 @ 19.50
Langdon..... ton 19.75 @ 20.00
Summerlee..... ton 19.50 @ 20.00
Dalmellington..... ton 18.00 @ 18.25
Clyde..... ton 18.25 @ 18.50

Rails.

Steel, at Eastern mills..... ton \$34.50 @ 35.00
Old Rails, Ts..... ton 21.75 @ 22.00

Scrap.

Wrought, per ton, from yard..... \$19.50 @ 20.00

Bar Iron from Store.

Common Iron:
1 to 2 in. round and square..... \$1.80 @ 1.90¢
Refined Iron:
1 to 2 in. round and square..... \$2.00 @ 2.30¢
1 to 2 in. 3/4 and 5-16..... \$2.30 @ 2.50¢
Rods—1/2 and 11-16 round and sq..... \$2.30 @ 2.50¢
Bands—1 to 6x3-16 to No. 12..... \$2.30 @ 2.50¢
Burden's Best Iron, base price..... \$2.50 @ 3.00¢
Burden's "H. B. & S." Iron, base price..... \$2.50 @ 3.00¢
Norway Rods..... \$2.50 @ 2.60¢

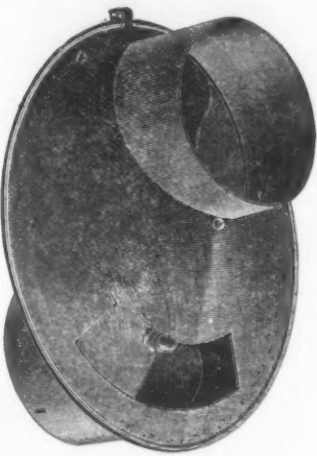
Sheet Iron from Store.

Common American Cleaned
Nos. 10 to 16..... \$2.61 @ 2.70¢
17 to 20..... \$2.75 @ 2.85¢
21 to 24..... \$2.85 @ 2.95¢
25 and 26..... \$2.95 @ 3.05¢
27..... \$3.05 @ 3.15¢
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NOVELTIES.

Adjustable Elbow and Damper.

The Adjustable Elbow and Damper Company, Haverhill, Mass., are offering to the trade a new form of adjustable elbow for stove and furnace pipes. The improvement briefly described consists in having two shallow conical-shaped disks, which are held together by a U-shaped flange or band that



Adjustable Elbow and Damper.

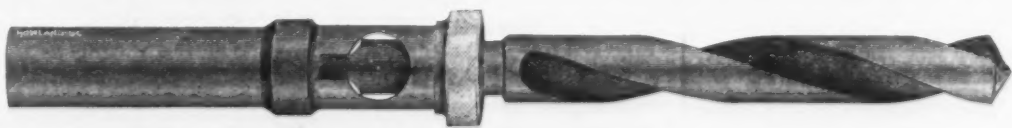
allows either disk to turn so that the pipe collars may be adjusted in relation to each other for lengthening or shortening the elbow or offset. Each elbow has a cold-air check and damper, which, it will be seen by reference to the engraving, is a leaf of sheet metal pivoted at the center of the elbow, and so adjusted that when pushed to one side by the knob shown it will both close the stove-pipe and open an air inlet into the chimney. Among the advantages claimed for this elbow is that it can be adjusted to fit the varying heights of stove and flue by simply turning one of the disks. The elbows are a little over a foot in diameter, and are made with 5, 5½ and 6 inch pipe collars. The material used is Russia or planished iron. The two disks are held together by a bolt passing through the center, and provided at one end with a thumb-screw, so that in case of the elbow becoming clogged with soot or dust the thumb-screw can be loosened and the two parts separated for cleaning.

A New Sporting Gun.

The trial of a new sporting gun made by Messrs. Holland, Bond street, London, came off recently at their Kensal Green range with satisfactory results. This gun is both a rifle and a shotgun, and throws small shot and conical bullets with equal accuracy. Both barrels are rifled about an inch downward from the muzzle, but, according to present experience, this has no effect upon the small-shot practice, or, if anything, rather improves it. It is superior to an ordinary cylinder gun and about equal to a modified choke bore. The gun is a 12-bore central fire, and in outward appearance is just like an ordinary fowling-piece.

The Strange Forged Twist Drills and Chucks.

The Strange Forged Twist Drill Company, New Bedford, Mass., are making a new line of twist drills, designated as above, the drills being forged from round steel rods by a process invented by John F. Strange. Instead of being made by swedging straight grooves into round rods and twisting them afterward, these drills have the grooves forged in the form in which they are turned out without twisting the rod. This is accomplished by a simple mechanism applied to an ordinary trip hammer, the operation being thus described: The heated rod is placed crosswise under the hammer, and is kept from rolling by guides on the anvil. The twisted grooves are made by a diagonal peen on the anvil at a sharp angle with the rod to be forged, and a similar peen on the hammer set at the same angle in the opposite direction. The hammer and anvil have hollow swedges also, in which the rod is occasionally placed for a few blows to keep it straight, round and of uniform size, the process of forging the grooves having a tendency to enlarge the circumference of the rod. The forgings are made in pieces long enough for two drills, the grooves



The Strange Forged Twist Drill and Chuck.

being put in the central portion of the rod, and after it is cut in two the ends form the shanks of the drills. This process of manufacture is claimed to insure perfect uniformity and regularity of twist, while especial attention is called to the fact that the cutting edge of the drill is on the hammered surface, and that at the point of the drill also the effects of the hammering are secured, thus giving exceptional durability to this part. The process of forging the drills is a rapid one, and it is said that large twist drills were never turned out before by any method so fast and with so little labor. After the forging is completed and the drills are cut separate they are ground by a process in which they are slowly turned while in contact with the stone, to insure a perfectly cylindrical drill, and to prevent binding and choking when in use the outside surface behind the lip of the cutting edge is further dressed off with an emery-wheel. Two sides of the shank end of the drill are then milled off flat, so as to make the end fit the chuck, which is also manufactured by the company and is represented in the illustration. The drills are regularly made with straight shanks, as shown, but are made with taper shanks, if ordered, to fit any socket desired. The drills

financial writer of a leading evening paper. To soothe those frightened by a sagging market he tells them that "over 100 iron establishments were started last week in Pennsylvania."

Industrial operations in the Schuylkill Valley are beginning to reap the benefits of the competition of the Pennsylvania and the Reading roads in that district. Reports of the opening of rolling mills and the firing of furnaces come from such points as Norristown and Reading.

The New York Cable Company appeal to the court at Albany against the decision of the Supreme Court which stopped the building of the road. The documents submitted covered over 1000 pages.

The Union Foundry and Machine Company, of Catasauqua, Pa., are making a large amount of ironwork and castings for one of the new Alabama furnaces.

Governor Pierce, of Dakota, says 85,000 people have settled within that Territory in the past year, and that the population now amounts to 500,000.

MANUFACTURING.

Iron and Steel.

The Pittsburgh Smelting Company, Limited, of Pittsburgh, are now manufacturing a wrought copper tuyere made of sheet copper, welded and brazed, which, it is claimed, outlasts twice over any other tuyere that is now made. These tuyeres are perfectly homogeneous and reliable, there being no possibility of blow holes or irregular thickness, as there is in cast tuyeres of all kinds. When one of these tuyeres is burned it can be easily and cheaply repaired. Altogether these tuyeres are a vast improvement over cast ones, and are well worth the attention of every blast-furnace manager.

There were 3396 names on the pay-roll of the Pennsylvania Steel Works, at Steelton, Pa., during the month of September. The amount of wages paid for that month amounted to \$136,000, the largest in the history of the company.

At a meeting of the Board of Directors of the Junction Iron Company, held last week in the office of the company at Wheeling, W. Va., Henry K. List was chosen president to fill the vacancy caused by the death of Samuel Laughlin, and George A. Dean was appointed general superintendent of the works. No other changes were made.

Furnace F of Carnegie Bros. & Co., at Braddock, Pa., was successfully blown in on the 15th inst., making a total of six furnaces in blast and one building, all owned by the above company. Furnace G is rapidly approaching completion and will be blown in about the first of the year. When this occurs Carnegie Bros. & Co. will have the distinction of being the largest pig-iron producers in the world.

The iron mill of W. H. Everson & Co., at Scottsdale, Pa., is rapidly nearing completion. It consists of two trains of sheet rolls, one train for making heavy gauges and one train for making light gauges of sheet iron and steel, and one complete 18-inch skelp iron train, for skelp iron from 12 to 20 inches wide. A 40-inch cylinder engine with 60-inch stroke and 40-ton fly-wheel will furnish the motive-power. The engine was built by the Pusey & Jones Company, of Wilmington, Del., and the roll trains by Totten & Co., of Pittsburgh. This mill is being built with numerous improvements, and is expected, when completed, to be one of the best built rolling mills in the State. The construction of the mill is under the personal supervision of the manager of the works, George H. Everson.

It is rumored that the Sloss Furnace Company, Birmingham, Ala., contemplate establishing steel works.

The open-hearth furnace of Graff, Bennett & Co., at Pittsburgh, was started up last week with 40 men after being idle all summer. This is the largest furnace of its kind in the country, and can turn out a heat in less than seven hours.

D. R. Lean and Thomas S. Blair, of Pittsburgh, have formed a partnership under the firm name of Lean & Blair as engineers and contractors for the erection of steel works, blast furnaces, &c. Mr. Lean will be remembered by many as having been in the business of furnace building &c., in Pittsburgh for 18 years past, and has built some of the largest plants in this country. Mr. Blair, who has been engaged for five or six years in the manufacture of steel, is the son of Thomas S. Blair, who was one of the pioneers in steel-making in this country. The open-hearth plant which the above firm is erecting for the Indianapolis Rolling Mill Company, at Indianapolis, Ind., mention of which was made in these columns some time ago, is rapidly approaching completion and will be a model plant. It will be completed a month sooner than called for in the original contract, which was 120 days, or in other words the entire plant will be completed in 90 days from the time work was commenced.

James Hooven & Son, of Norristown, Pa., have leased their furnace to Isaac McHose, of Reading, Pa. As soon as repairs are completed the furnace will be blown in on Bessemer pig. It has a capacity of 600 tons per week.

The new furnace being erected by Jones & Laughlins, of the American Iron Works, at Pittsburgh, is almost completed. It is 85 feet high, with a 20-foot bosh, and has four hot blast stoves. The height of the smoke-

stack is 175 feet. The furnace is the largest one in the United States and will have a capacity of 200 tons per day. The cost of the furnace is about \$200,000.

Mary Furnace, the property of the Ohio Iron and Steel Company, at Lowellville, Ohio, which went out of blast a few weeks ago for repairs, will be blown in in a few days.

The Reading Iron Works, at Reading, Pa., are about to erect a large pipe mill adjacent to their plant in that city. The new structure will be about 100 feet wide and nearly 300 feet long.

Reed Bros., tack manufacturers of Brockton, Mass., have removed their rolling mill from Matfield to Brockton. Tack and nail plate to supply their works and a few others is the principal product of the mill.

The Roller Chain Belting Company, of Columbus, Ohio, report that they are running full force night and day in order to keep up with the demand for their roller chain. New machinery is also being added, which will greatly increase the capacity.

The mills of the North Chicago Rolling Mill Company, at South Chicago, Ill., are

running as usual and on full time, the wreck of the collapsed repair shop having been cleared away.

The large foundry of Schreidt & Miller at Mansfield, Ohio, was totally destroyed by fire on the 17th inst. Loss about \$60,000; insurance, \$18,000.

The Hinkley Locomotive Works, of Boston, Mass., are preparing to start up again after being closed up for 14 months.

The Blake Steam Pump Company, of Boston, Mass., report a successful year's business, with a very good outlook for the coming year.

The Harlan & Hollingsworth Company, Wilmington, Del., have a contract for a new iron steamboat 15 feet longer than the Albany, to replace the burned Drew in the Day Line to Albany, N. Y.

The I. P. Morris Company, of Philadelphia, Pa., are at present building two beam engines for the Pioneer Iron and Mfg. Company, of Birmingham, Ala., and some heavy machinery for the Calumet and Hecla Copper Company. The engines have 7 foot diameter of blowing cylinder and 60 foot diameter steam cylinder, with 7 foot stroke. A similar engine will go to the Lehigh region.

The Pratt & Whitney Company, Hartford, Conn., are introducing a metal band saw and a centering machine with two spindles.

Young & Thomas, 42 Cortlandt street, New York, are now putting on the market the machinery formerly represented by G. G. Young, of that address.

The Philadelphia Drop Forge Company, of Philadelphia, are putting on the market a new device for reconnecting chains if broken. As described it seems to be a very simple piece of apparatus, likely to meet with a ready sale.

The Waltham Emery Wheel Company, Waltham, Mass., have recently increased their facilities by the erection of a new building, 50 x 50 feet, two stories high, which is used in connection with their old quarters adjoining. The company report a large increase of trade, and a bright outlook for the future.

The Roller Chain Belting Company, of Columbus, Ohio, are still running full force night and day, and at the same time adding new machinery to their works.

A. H. Osborn, Parkersburg, W. Va., is laying the foundation for machine shops.

The Sedgwick Machine Works Company, will erect new buildings, to cost \$11,000, at Poughkeepsie, N. Y.

The Barrett Vise and Tool Company, of Meadville, Pa., recently shipped to the Lansing Engine and Iron Works, Lansing, Mich., one of their improved cylinder boring machines. This tool is guaranteed to bore and face four 9 x 12 inch cylinders in 10 hours.

The American Valve and Governor Company, Chicago, have been incorporated; capital stock, \$100,000; incorporators, Dennis O'B. Ladd, Charles Schmid, George P. Fisher, Jr., and James H. Pierce.

The Baldwin Locomotive Works, Philadelphia, are at present extremely busy and working up to about their full capacity, turning out some 13 locomotives per week, or at the rate of fully 650 per annum.

The Baxter Electrical Motor and Mfg. Company, capital stock \$200,000, have been incorporated at Baltimore to manufacture electrical implements and machinery, with Benson M. Greene, James D. Mason, Jr., James F. Morrison, William Baxter, Jr., William V. Logan, Leopold Strouse and Samuel Rosenthal as directors. They are doubling the capacity of their present plant and will employ 50 more hands. They contemplate erecting a large factory to employ from 300 to 400 hands.

Sargent & Greenleaf, Rochester, N. Y., announce that they have not had a fire since 1874, that they run their works to their full capacity 12 months in the year, and have never had a strike or been threatened with one.

The National Rivet Works, Charles E. Brown, proprietor, New Haven, Conn., are moving into more commodious quarters, giving improved facilities and permitting an enlarged reduction.

The Birmingham Chain Works, Birmingham, Ala., B. F. Roden, president, have increased their capital stock to \$30,000, and will enlarge their works.

The Champion Nut Lock Company, of Peoria, Ill., were incorporated recently to manufacture nut locks and bolts; capital stock, \$25,000.

The American Steel Scraper Company, Sidney, Ohio, have in course of erection new factory buildings of brick, two stories in height, west of the D. and M. Railroad depot at that point. The buildings cover about half an acre of ground surface, and are built separately to insure against damage to the whole in case of fire. They will be fitted up with new and improved machinery. A new department, the manufacture of wheelbarrows, will also be added.

The Philadelphia Drop Forge Company, Philadelphia, are making a line of antique spear-pointed wrought-iron picket heads and points for cemetery inclosures and similar purposes. These points can be welded on ordinary bars, and are described as both strong and handsome, and not liable to break or come off. They are alluded to as having met with considerable success, and an increasing demand is anticipated.

The Ireland Mfg. Company, Cincinnati, Ohio, manufacturers of bronze builders' hardware, have about completed the erection of a new building 75 x 40 feet, two stories high, on the lot adjoining their present factory site. This building will be devoted to offices, warehouses, &c., and the space formerly occupied by these departments will be devoted to manufacturing hereafter. They have also enlarged their

foundry to thrice its former capacity, having put in three new furnaces, and have rearranged their manufacturing department, by which they are enabled to increase their working force by 75 additional hands.

Miscellaneous.

The Connellsville Coke Syndicate held its regular monthly meeting in Pittsburgh last week, and fixed the price of coke to dealers at \$1.60, and to furnaces at \$1.75 per ton. The syndicate complains of a lack of cars in which to ship, and coke is accumulating rapidly at the works.

The North Side Gas Company, of Pittsburgh, capital stock \$96,000, were chartered in Harrisburg last week.

The American Fire-Brick Works, at Rochester, Pa., owned by S. Barnes & Co., were burned on the 21st inst. Loss, \$12,000; insurance, \$8000.

The Charlotte Mining Company, composed wholly of Pittsburghers, have leased 3000 acres of land in Mechenberg, Halifax and Charlotte counties, Virginia, for the purpose of mining silver ore.

At a meeting of window glass manufacturers held at the Monongahela House, Pittsburgh, last week, preliminary steps were taken to establish a syndicate. All manufacturers in Pittsburgh and the West are eligible to membership. The object of the proposed combination is to raise and maintain prices.

The works of the Diamond Drill Company, at Birdsboro, Pa., have been compelled to shut down for want of water, and 50 men are out of employment. No rain of consequence has fallen for 80 days.

Color Blindness on French Roads.

The following from the "Revue Generale des Chemins de Fer," shows the results of a recent examination for color blindness and defective color sense of 11,173 employees of the Northern Railway of France. This road employs 46,900 men, 11,173 of whom have duties connected with the movement of trains, and all these, whatever their position, were required to pass a very rigid examination in regard to their sense of color, with the following result:

Occupations.	Confuse all colors.	Red blind.	Green blind.	Confuse red and green.	Weak color sense, blue and gray.	Total.
Station agents.....	1	1	1	5	4	12
Conductors.....	1	1	1	5	4	12
Engineers.....	1	1	1	5	4	12
Car inspectors.....	1	1	1	5	4	12
Switchmen.....	1	1	1	5	4	12
Trackmen.....	1	1	1	5	4	12
Gate keepers.....	1	1	1	5	4	12
Subordinate depot employees.....	1	1	1	5	4	12
Totals.....	5	8	8	45	40	118

These examinations were made with skeins of different colored worsted yarn containing many duplicate and similar shades and colors. The applicant was asked to match the colors, and his color sense was judged from the accuracy and promptness with which he selected the proper shades. In the column headed "Weak color sense" are placed all those who hesitated in the selection of a color, but who, after a moment's consideration, selected the right shade. Deducting this 118 from the total 224 leaves 106, or less than 1 per cent., actually color blind. If from these are taken the 40 who confused only green with blue and gray, errors which could cause no accident in railway signaling, there remains only 66 out of a total of 11,173, or not quite 1/2 of 1 per cent. These results are very much below the average results of the investigations of Messrs. Lederer in Russia, Douders in Holland, Holmgren in Sweden, Reuss in Austria and Jeffries in the United States, who found from 2 to 4 per cent of the men examined by them color blind.

Iron ore shipments from the 16 largest mines in the Lake Superior region for the season to October 6 were as follows:

Name.	Tons.
Minesota Iron Company.....	247,461
Lake Superior Iron Company.....	207,581
Colby Iron Company.....	201,367
Republic Iron Company.....	198,632
Cleveland Iron Company.....	196,508
Chapin Iron Company.....	141,295
Vulcan Iron Company.....	131,955
Champion Iron Company.....	108,748
Norrie Iron Company.....	103,399
Pittsburgh and L. A. Iron Company.....	100,163
Norway Iron Company.....	92,999
Jackson Iron Company.....	78,562
Aurora Iron Company.....	69,653
Ludington Iron Company.....	67,632
Iron River Iron Company.....	61,694
Ashland Iron Company.....	51,142
Aggregate of 51 smaller mines.....	785,800
Total.....	3,796,259

Port shipments to October 6: Escanaba, 1,207,410; Marquette, 709,318; Ashland, 576,383; Two Harbors, 247,451; St. Ignace, 58,272 tons.

The Standard Gas Lamp Company, 411 Cherry street, Philadelphia, issue a circular calling the attention of railroad officials to the merits of Dyott's patent system of lighting railroad depots. It is claimed that by the use of this system 50 to 75 per cent. of the cost of lighting may be saved. It is said that by the Dyott system, which does not employ electricity, 100 or 200 burners can be lighted and extinguished 30 times in one minute by turning one stop-cock. The saving, it will thus be seen, is affected by being able to extinguish the lights in a depot when they are not needed and by so doing lessen the gas consumption. It is further mentioned that as no torch or matches are used all danger from fire is avoided. An accompanying illustrated sheet shows the lamp in a number of different styles.

A number of the Gogebic mines have made contracts with the Lake Shore and Western to carry ore through the winter by rail to Milwaukee and Chicago at \$2.25 a ton. This is much lower than the present rail and water route.

Imports.

The following were the Imports of Hardware, Iron, Steel and Metals into the Port of New York for the week ending October 27, 1886:

Hardware.	Munson John W. & Co.
Baur von C. H.	Wire rope, coils, 2
Cables, 3	Wire rope, coils, 9
Berkebeck Julius & Co.	Perkins C. L. & Co.
Nails, case, 1	Ferronanganese, tons, 250
Baker Hermann & Co.	Stetson Geo. W. & Co.
Cutlery, cs., 6	Pack, tons, 200
Berkshaw R. C.	Williamson Jas. & Co.
Packages, 9	Pig, tons, 200
Cameron & Forster.	Order.
Case, 1	Pig, tons, 450
Copper, box, 1	Ore, tons, 1125
Iron wire, cs., 134	Rods, bbls., 2636
Curtis R. J.	Wire rods, cs., 6
Cables, 5	Wire rods, bbls., 50
Anchors, 32	Wire rods, coils, 31
Curley J. & Bro.	Old rails, pcs., 4 80
Cutlery, case, 1	Pdls. and bars, 7116
Downing R. F. & Co.	Ba & 2 1/4
Mach'y, pks., 9	Spl. cs., tons, 250
Field Alfred & Co.	Wrought pipes, 122
Cases, 9	Rails, 543
Mdse, cs., 7	Scrap, lot, 1
Folsom H. & D.	
Arms, cs., 12	
Foley E.	
Mach'y, cs., 16	
Graef Cutlery Co.	
Cases, 7	
Harmony Mills.	
Mach'y, case, 1	
Hubbell & Randall.	
Cases, 2	
Hartley & Graham.	
Guns, cs., 12	
Kastor A.	
Mdse, cs., 3	
Karnack B. & Co.	
Cutlery, cs., 3	
Lau J. H. & Co.	
Arms, cases, 4	
Cases, 3	
Lesen, Heiter & Glen.	
Cases, 8	
Lings & Mach'y, pks., 8	
McComas Alex.	
Rifles, pks., 9	
McCoy & Sanders.	
Cases, 4	
Chains, case, 1	
Rogers Henry.	
Cases, 3	
Schoverling, Daly & Gales.	
Arms, cs., 27	
Cases, 6	
Sheldon S. W. & Co.	
Cases, 10	
Schutte W. & Co.	
Rods, bbls., 33,773	
Cases, 8	
Ironware, cs., 4	
Swey Paul.	
Mach'y, cs., 2	
Taylor Thomas.	
Cases, 5	
Vom Cleff & Co.	
Cases, 17	
Von Lengerke & Detmold.	
Cases, 5	
Wiebusch & Hilger.	
Arms, cs., 10	
Cases, 10	
Chains, cs., 19	
Witte J. G. & Co.	
Cutlery, cs., 2	
Case, 1	
Wright Peter & Co.	
Cases, 10	
Order.	
Arms, cs., 38	
Mach'y, cs., 15	
Cutlery, cs., 4	
Mach'y, pks., 2	
Iron.	
Baring Bros. & Co.	
Bars, 2675	
Ore, tons, 200	
Brown Bros. & Co.	
Coils, 153	
Coddington T. B. & Co.	
Sheet, bbls., 369	
Crocker Bros.	
Pig, tons, 100	
Spiegel tons, 390	
Ferro iron, cs., 118	
Drexel, Morris & Co.	
Pig, tons, 200	
Erie Desp. Co.	
Pig, tons, 200	
Kunhardt & Co.	
Bundles, 19	

The imports of Cutlery, Hardware and Metals at this port during the week ending October 22 were as follows:

Quantity.	Value.
Brass goods.....	68
Bronzes.....	47
Clocks.....	50
Copper.....	370
Cutlery.....	115
Dutch metal.....	30
Guns.....	138
Gun wads.....	10
Hardware.....	1,080
Iron, pig, tons.....	963
Iron, sheet, tons.....	218
Iron, spiegel, tons.....	2,788
Iron, ore, tons.....	2,177
Iron, tubes.....	70
Iron, other, tons.....	351
Lead, pigs.....	2,411
Machinery.....	432
Metal goods.....	10
Nails.....	60
Needles.....	17
Nickel.....	4,880
Old metal.....	10,922
Patina.....	21
Plumbago.....	21
Percussion caps.....	7
Pias.....	21
Quicksilver.....	750
Radiators.....	31
Steel.....	187,072
Spelter, b.....	11,250
Tin, bks.....	10,002
Tin, slabs, 3,056.....	332,584
Wire.....	77

Exports.

The following table presents the Exports of Hardware, Iron, Steel, Metals, &c., from the port of New York, for the week ending October 26, 1886:

Quantity.	Value.
Metal, box.....	1 3/4
Mach'y, pks.....	2
Tacks, cs.....	2
Saw, ma, cs.....	2
Nails, regis.....	6
Nails, cs.....	3
Hdw., cs.....	13
Stettin.	
Hdw., cs.....	56
Clocks, boxes.....	18
Copenhagen.	
Hdw., cs.....	3
Clocks, cs.....	22
Hamburg.	
Arms, cs.....	2
Clocks, cs.....	74
Cutlery, case.....	1
Ag imp, pks.....	7
Wringers, cs.....	12
Tinware, cs.....	12
Saws, case.....	1
Wringers, case.....	1
Saw, ma, cs.....	472
Mach'y, pks.....	5
Hdw., cs.....	134
Mot. ware, case.....	1
Copper, bars.....	10
Saw.....	1
Gothenburg.	
Clocks, cs.....	30
Mach'y, pks.....	2,900
Bremen.	
Hdw., cs.....	95

Quantity.	Value.
Sew, ma, cs.....	24
Leith.	
Hdw., cs.....	9
Tinware, case.....	1
Glasgow.	
Sew, ma, cs.....	38
Hdw., cs.....	14
Clocks, cs.....	79
Rifle.....	1
Hull.	
Hdw., pks.....	85
Ag imp, pks.....	8
Forges, pks.....	6
London.	
Iron, pks.....	1
Hdw., cs.....	82
Hdw., cs.....	146
S. rollers, cs.....	42
Sew, ma, cs.....	12
Cartridges, cs.....	9
Ag imp, pks.....	1
Wringers, cs.....	20
Oxide zinc.....	50
L. rolls, pks.....	20
Clocks, pks.....	285
Mf. iron, pks.....	4
Rifles, cs.....	2
British Honduras.	
Sew, ma, cs.....	12
Clocks, cs.....	10
Sew, ma, cs.....	2
Hdw., cs.....	15
Nails, regis.....	23
Pumps, pks.....	3
Ag imp, pks.....	2
British West Indies.	
Nails, regis.....	4
Pumps, pks.....	1
Hdw., cs.....	11
Hdw., cs.....	41
Ag imp, pks.....	1
Nails, case.....	1
Sew, ma, cs.....	79
British Possessions in Africa.	
Sawmill.....	1
Clocks, cs.....	2
New Brunswick.	
Pig iron, tons.....	280
British Australia.	
Hdw., cs.....	39
Ag imp, pks.....	5
Firearms, case.....	11
Air guns, case.....	1
Clocks, cs.....	10
W. mills, pks.....	33
Chain, bu.....	1
Car-wheels.....	30
Mf. iron, pks.....	10
Cutlery, cs.....	27
Cartridges, cs.....	65
Wringers, cs.....	4
Wire cloth, cs.....	1
Saws, cs.....	1
Mach'y, pks.....	14
British Guiana.	
Hdw., cs.....	2
Nails, regis.....	10
Ag imp, pks.....	2
Hong Kong.	
Guns, cs.....	4
Cartridges, cs.....	2
Mf. iron, pks.....	1
Haere.	
Hdw., cs.....	17
Mach'y, pks.....	6
Tinware, cs.....	7
Copper, cs.....	355
Ag imp, pks.....	8
Sew, ma, case.....	1
Copper, cs.....	180
Marseilles.	
Clocks, cs.....	5
Wringers, cs.....	9
Bits, case.....	1
French West Indies.	
Saws, case.....	1
Tinware, cs.....	4
Mf. iron, pks.....	6
Bitbao.	
Prig. pres-es.....	6
Sew, ma, cs.....	19
Porto Rico.	
Hdw., cs.....	5
Genoa.	
Pumps, pks.....	4
Naples.	
Mf. iron, pks.....	1
Cuba.	
Mach'y, pks.....	1497
Cutlery, cs.....	117
Mf. iron, pks.....	1,728
Copper, case.....	1
Tinware, cs.....	2
Locomotive.....	1
Locomotives.....	20
Meters, case.....	5
Boilers.....	5
Saws, cs.....	2
Ag imp, pks.....	8
Pumps, pks.....	3
Wire gus.....	3
Nails, cs.....	20
Hayti.	
Nails, regis.....	45
Ir. hoops, bbls.....	14
Tin plates, cs.....	2
Hdw., cs.....	32
San Domingo.	
Heater.....	1
Iron pipe, pcs.....	306
Cutlery, pks.....	4

Quantity.	Value.
Hdw., cs.....	6
Rivets, regis.....	5
Ag imp, pks.....	3
Cop'r tubes, cs.....	10
Mach'y, pks.....	10
Riding spurs, case.....	1
Per. caps, case.....	1
Tinware, case.....	1
Mf. iron, pks.....	8
Nails, regis.....	10
Iron, pks.....	12
Central America.	
Ag imp, pks.....	2
Per Caps, cs.....	2
Sew, ma, cs.....	2
Mexico.	
Sew, ma, cs.....	12
Mach'y, pks.....	201
Gun, ma, cs.....	1
Cutlery, cs.....	4
Iron, pks.....	189
Sold, copper, case.....	1
Hdw., pks.....	19
Tinware, cs.....	2
Tacks, cs.....	13
Per. cs, cs.....	2
Saws, case.....	1
Nails, case.....	1
Pumps, pks.....	5
Nails, regis.....	50
Spikes, regis.....	22
Uruguay.	
Pumps, pks.....	8
Ag imp, pks.....	85
Clocks, cs.....	2
Mf. iron, pks.....	2
Hdw., pks.....	32
Argentine Republic.	
Ag imp, pks.....	46
Tacks, cs.....	7
Mach'y, pks.....	7
Clocks, cs.....	15
Mf. iron, pks.....	153
Car w. and a.....	725
G. faultware, case.....	9
Hdw., pks.....	123
Liabon.	
Hdw., cs.....	6
Water-closets, case.....	2
W. mills, pks.....	5
Mf. iron, pks.....	7
Cutlery, case.....	1
Chili.	
Mf. iron, pks.....	106
Hdw., cs.....	130
Tacks, cs.....	11
Tinware, cs.....	2
Agateware, cs.....	2
Sew, ma, cs.....	82
Locomotive.....	1
Clocks, cs.....	29
Cutlery, cs.....	54
Nails, regis.....	1,500
Ag imp, pks.....	35
Nails, cs.....	30
Cartridges, cs.....	1
Oporto.	
Agateware, cs.....	8
Firearms, case.....	1
Clocks, cs.....	54
Hdw., cs.....	18
Cartridges, cs.....	1
United States of Colombia.	
Mach'y, pks.....	175
Sew, ma, cs.....	93
Tinware, cs.....	7
Guns, cs.....	2
Shot, cs.....	3
Q. salver, flks.....	39
Cop. gds, pks.....	6
Cartridges, cs.....	6
Lead, cs.....	3
Arms, cs.....	3
Yel. met, cs.....	15
Lead, rolls.....	2
Steel, pks.....	3
Ld. pipe, case.....	1
Heils, cs.....	3
Zinc, casks.....	2
Boiler.....	1
Hdw., pks.....	103
Cutlery, pks.....	14
Mf. iron, pks.....	17
Clocks, pks.....	22
Car-wheels.....	94
Shot, regis.....	5
Pumps, pks.....	4
Iron, pks.....	219
Axles.....	12
Railroad cars, cs.....	6
Wire rope, roll.....	1
China.	
Hdw., case.....	5
Brasil.	
Hdw., cs.....	56
Cartridges, cs.....	307
Cutlery, cs.....	307
Nails, pks.....	6
Mach'y, pks.....	1
Mf. iron, pks.....	21
Sew, ma, cs.....	21
Firearms, cs.....	5
Clocks, cs.....	2
Venezuela.	
Sew, ma, cs.....	31
Tinware, cs.....	2
Iron, pks.....	406
Steel, pks.....	10
Hdw., cs.....	113
Clocks, cs.....	4
Mf. iron, pks.....	130
Nails, regis.....	10
Mach'y, pks.....	10
Cutlery, cs.....	3

bbbs.....	50	315
L. rolls, pkgs.....	20	1,000
Clocks, pkgs.....	285	5,000
Mf. iron, pkgs.....	32	3,261
Rifles, cs.....	2	240
British Honduras.		
Sew ma., cs.....	12	90
Clocks, cs.....	10	161
Sew. ma., cs.....	2	79
Hdw., cs.....	16	225
Nails, kegs.....	83	953
Pumps, pks.....	9	95
Ag. Imp., pks.....	3	35
Uruguay.		
Pumps, pkgs.....	8	185
Ag. imp., pkgs.....	85	915
Clocks, cs.....	2	2
Mf. iron, pks.....	2	46
Hdw., pks.....	32	32
Argentine Republic.		
Ag. imp., pks.....	46	46
Tacks, cs.....	7	7
Mach'y, pks.....	7	7
Clocks, cs.....	15	15
Mf. iron, pks.....	153	153
Car w. and a.....	725	725
G. faultware, case.....	9	9
Hdw., pks.....	123	123
Liabon.....		
Hdw., cs.....	6	6
Water-closets, case.....	2	2
W. mills, pks.....	5	5
Mf. iron, pks.....	7	7
Cutlery, case.....	1	1
Chili.		
Mf. iron, pks.....	106	106
Hdw., cs.....	130	130
Tacks, cs.....	11	11
Tinware, cs.....	2	2
Agateware, cs.....	2	2
Sew, ma, cs.....	82	82
Locomotive.....	1	1
Clocks, cs.....	29	29
Cutlery, cs.....	54	54
Nails, regis.....	1,500	1,500
Ag imp, pks.....	35	35
Nails, cs.....	30	30
Cartridges, cs.....	1	1
Oporto.		
Agateware, cs.....	8	8
Firearms, case.....	1	1
Clocks, cs.....	54	54
Hdw., cs.....	18	18
Cartridges, cs.....	1	1
United States of Colombia.		
Mach'y, pks.....	175	175
Sew, ma, cs.....	93	93
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Shot, cs.....	3	3
Q. salver, flks.....	39	39
Cop. gds, pks.....	6	6
Cartridges, cs.....	6	6
Lead, cs.....	3	3
Arms, cs.....	3	3
Yel. met, cs.....	15	15
Lead, rolls.....	2	2
Steel, pks.....	3	3
Ld. pipe, case.....	1	1
Heils, cs.....	3	3
Zinc, casks.....	2	2
Boiler.....	1	1
Hdw., pks.....	103	103
Cutlery, pks.....	14	14
Mf. iron, pks.....	17	17
Clocks, pks.....	22	22
Car-wheels.....	94	94
Shot, regis.....	5	5
Pumps, pks.....	4	4
Iron, pks.....	219	219
Axles.....	12	12
Railroad cars, cs.....	6	6
Wire rope, roll.....	1	1
China.		
Hdw., case.....	5	5
Brasil.		
Hdw., cs.....	56	56
Cartridges, cs.....	307	307
Cutlery, cs.....	307	307
Nails, pks.....	6	6
Mach'y, pks.....	1	1
Mf.....		



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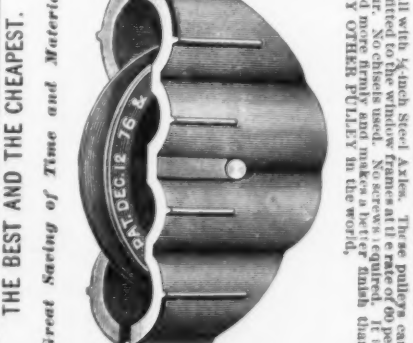
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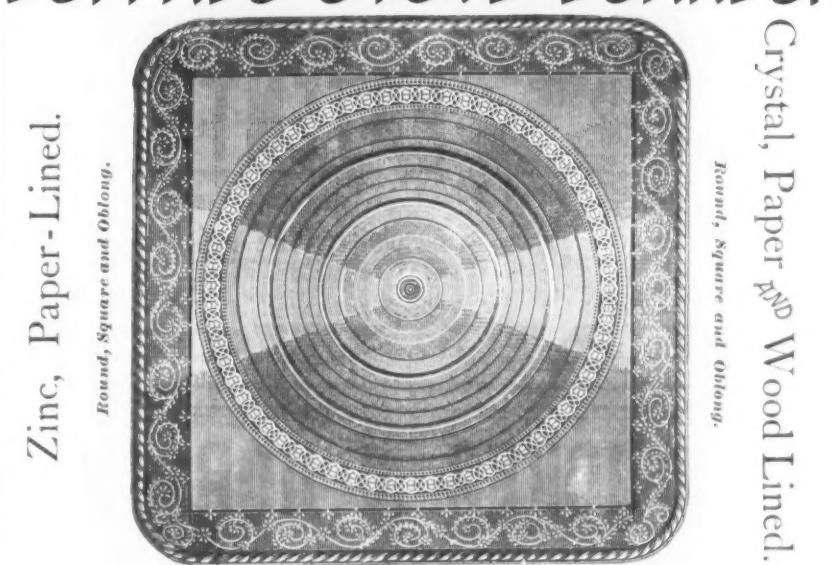
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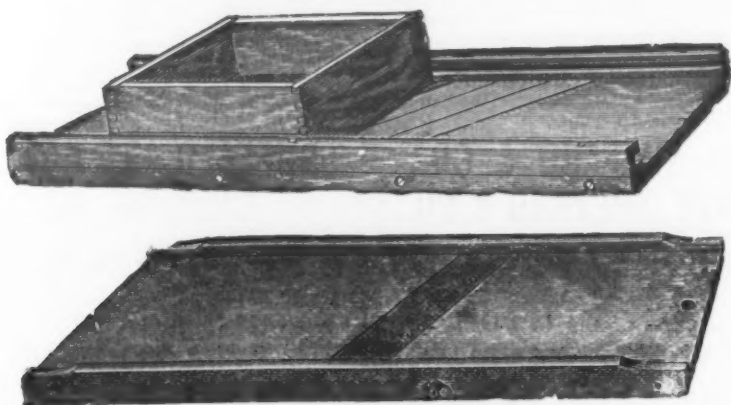
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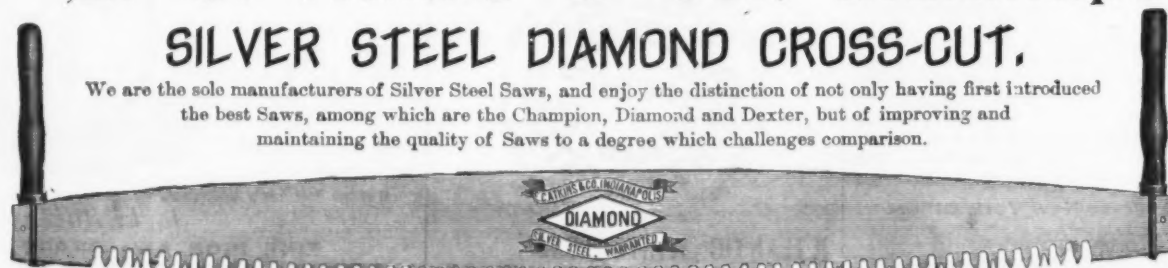
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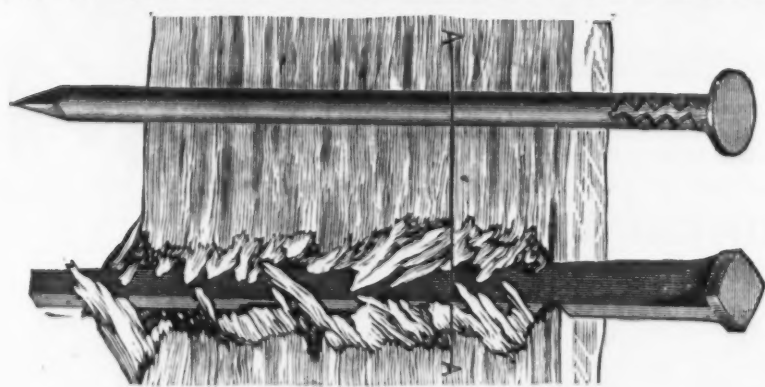
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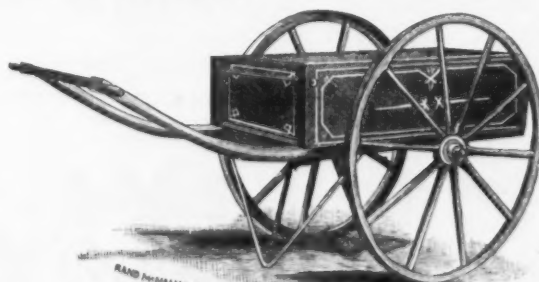
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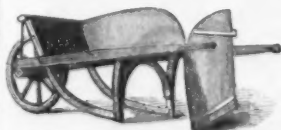
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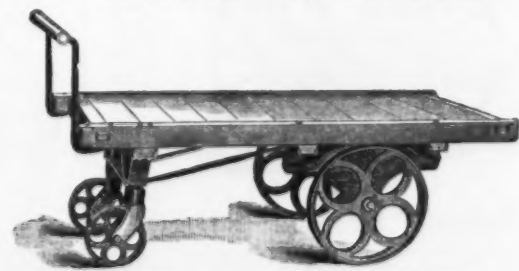
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Globe Patent Garden Barrow.



Capitol Patent Bolted Barrow.

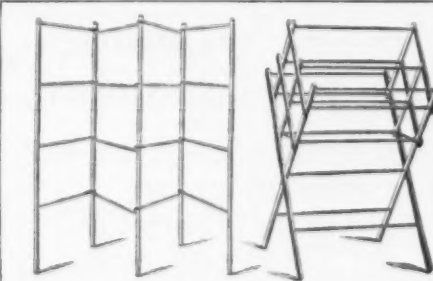


THE REYNOLDS IMPROVED TRUCK.

Front Wheels Casters. Truck turns in its own length.
Runs on or off elevator or scales at any angle. Is easily
dumped by lifting handle. Any size. Send for circular.

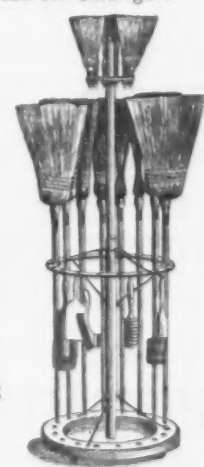
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MANUFACTURERS OF
ROPE REELS,
BROOM STANDS,
STEP LADDERS,
EXTENSION LADDERS,
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Largest line of Step Ladders in the
World. Send for Catalogue.



EXPANDING TAPS



From 3-4 in. to 10
in. Wrought-Iron
Pipe Size.

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WORSWICK MFG. CO., CLEVELAND, O.,

Manufacturers of
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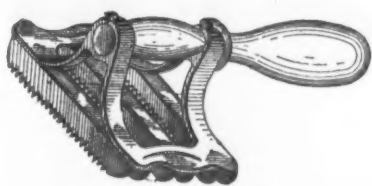
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Established 1830.

THE PLYMOUTH MILLS.

Rivets, Trunk Nails
Tacks, Clout Nails,
Burr, Wire Nails,
PLYMOUTH, MASS.

Pat. Curry Combs,



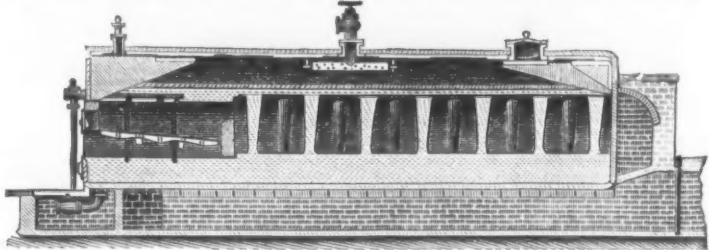
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SWEET & CLARK

MFG. CO.,

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THE GALLOWAY BOILER.



Safety, Maximum Economy in Fuel, Lowest Cost of Maintenance,
Greatest Durability, Large Steam and Water Spaces,
are the Advantages offered by this Boiler.

SPECIFICATIONS AND PRICES UPON APPLICATION TO

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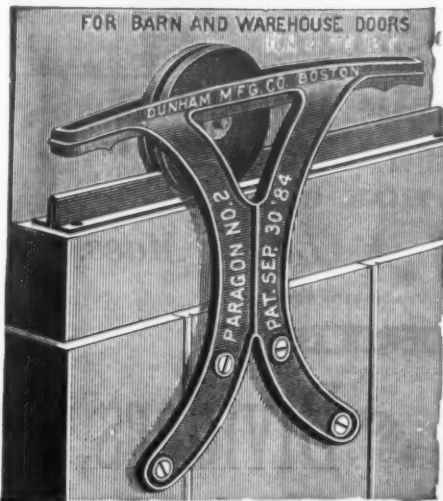
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PARAGON ANTI-FRICTION DOOR HANGER.



SPECIFIED BY ARCHITECTS AND BUILDERS.

We make the broad claim that the PARAGON HANGER is the BEST
device for operating sliding doors ever shown to the Trade,

BECAUSE

It is the strongest and most durable, made in one solid piece from air-furnace refined malleable iron (no bolts or rivets to wear and work loose), is the easiest operated, impossible to derail and never requires lubricating, and is by far the handsomest and finest finished Hanger in the market. Using the only polished steel Tee-Rail ever invented. Are made in three sizes (4 to 24 ft. run) for Barn and Warehouse use. No. 4 Parlor Hanger, pat. fiber wheel, absolutely noiseless, cannot wear out. Nos. 5 and 5½ for elevator and small house doors, and No. 6 Car Door Hanger now adopted by the leading railways in the United States.

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GEN'L AG'TS., LOUDERBACK, GILBERT & CO., 33 Chambers St., New York.

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MANUFACTURERS OF AND
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PLUMBAGO OR BLACK
LEAD

For All Purposes.

ALSO SHIPPERS OF THE CELEBRATED

CINCINNATI MOLDING SANDS

For Stove Plate, Heavy and Light Machinery, Agricultural and
Brass Work.

Agents for MONK'S CELEBRATED MOLDERS' TOOLS.

Send for Illustrated Catalogue and Price List. No charge for Samples.

EAGLE

THE LARGEST FACING MILLS
IN THE WORLD.
Capacity, 600 Barrels
Per Day.

FOUNDRY SUPPLIES

MILLS
HEAVY MACHINERY
AND FINE
STOVE PLATE FACINGS

A Specialty.

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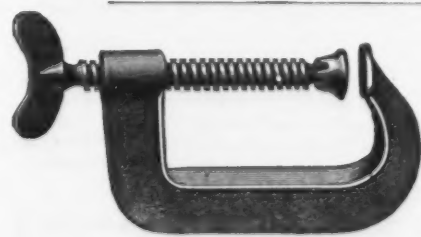
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WITH STEEL TOE CALKS.

The Best and Cheapest Shoes Made.

Warranted to Outwear Any Other Shoe.

Six Sizes Each. Blunt and Sharp Calk.



Eagle Screw Clamps,

WITH

BALL and SOCKET SWIVEL.

Ten Sizes. To Open.

2, 2 1/2, 3, 4, 5, 6, 7, 8, 10, 12 Inches.

Coach & Carriage Hardware & Fine Mountings

Malleable Iron and Brass Castings.

Correspondence solicited.

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BROWNE'S
UNIVERSAL
FLEXIBLE
WEATHER &
DUST
STRIP.
"THE BEST."
ANYONE CAN APPLY IT.

Has been on the market for nine years, is
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samples and discounts.

COURTENAY & TRULL,

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OSBORN MFG. CO.
TRADE MARK
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The Original Inventors and Manufac-
turers of the

"OSBORN"

Bright Metal Cages, in Brass, Bronze and Silver Plate.

NEW AND BEAUTIFUL DESIGNS JUST OUT.

We also Manufacture Brass and Bronze Show Stands for Fancy Goods, Catalogues Mailed Free.



With these devices, Transoms may be opened and closed
at will with ease and locked in position, no other fastenings
are required, any one can put them on. CAUTION, look for
the Trade Mark on the handles.

We are now prepared to fill orders for the "Crown" and "Star" Lifters, in such
sizes as are listed below, which are suitable for house and office transoms, and hope
soon to announce our ability to supply sizes for store transoms.

Price List "Crown" Lifters.				LIST.		Price List "Star" Lifters.			
No.	Length	Size of Rod.	Price Each.	APRIL 8th	No.	Length	Size of Rod.	Price Each.	
43	3 feet	3/8 x 1/2	Bronzed Iron. \$0.55	1886.	83	3 feet	3/8 x 1/2	Bronzed Iron. \$0.70	
44	4 "	" "	0.65		84	4 "	" "	0.80	
45	5 "	" "	0.75		85	5 "	" "	0.90	
46	6 "	" "	1.15		86	6 "	" "	1.20	
47	7 "	" "	1.35		87	7 "	" "	1.40	
48	8 "	" "	1.55		88	8 "	" "	1.60	
49	9 "	" "	1.75		89	9 "	" "	1.90	
50	10 "	" "	2.00		90	10 "	" "	2.25	
51	11 "	" "	2.25		91	11 "	" "	2.50	
52	12 "	" "	2.50		92	12 "	" "	2.80	
53	13 "	" "	2.75		93	13 "	" "	3.00	
54	14 "	" "	3.00		94	14 "	" "	3.25	
55	15 "	" "	3.25		95	15 "	" "	3.50	
56	16 "	" "	3.50		96	16 "	" "	3.75	
57	17 "	" "	3.75		97	17 "	" "	4.00	
58	18 "	" "	4.00		98	18 "	" "	4.25	
59	19 "	" "	4.25		99	19 "	" "	4.50	
60	20 "	" "	4.50		100	20 "	" "	4.75	
61	21 "	" "	4.75		101	21 "	" "	5.00	
62	22 "	" "	5.00		102	22 "	" "	5.25	
63	23 "	" "	5.25		103	23 "	" "	5.50	
64	24 "	" "	5.50		104	24 "	" "	5.75	
65	25 "	" "	5.75		105	25 "	" "	6.00	
66	26 "	" "	6.00		106	26 "	" "	6.25	
67	27 "	" "	6.25		107	27 "	" "	6.50	
68	28 "	" "	6.50		108	28 "	" "	6.75	
69	29 "	" "	6.75		109	29 "	" "	7.00	
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71	31 "	" "	7.25		111	31 "	" "	7.50	
72	32 "	" "	7.50		112	32 "	" "	7.75	
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74	34 "	" "	8.00		114	34 "	" "	8.25	
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222	182 "	" "	45.00		262	182 "	" "	45.25	
223									

ORDER BY NUMBER.

For Sale by J. F. WOLLENSAK, Chicago, Ill.

CRONK'S

Wrought Iron Barn Door Hanger

AND STAY ROLLER.



In offering to the trade of 1886 our celebrated Wrought
Iron Hangers and Stay Rollers, special attention
is called to our Iron Clad Track in connection with our
Hangers. It is made complete, only requiring Hammer and
Nails to attach it to the building. We make the broad claim
that whoever uses our Hangers and Iron Clad Track has the
best device known for sliding doors. These hangers never
break; cannot get off the track, and work so easy that they
can be operated by a child. Every pair guaranteed to give
satisfaction. For sale by hardware dealers generally.

CRONK HANGER COMPANY,
ELMIRA, NEW YORK.THE F. F. ADAMS CO.,
ELMIRA, N. Y.Send for Catalogue of
1885.

No. 2.



Adams Swing.

The popularity of the Adams Swing in the short
time it has been introduced is phenomenal.
The swing is constructed on original mechanical
principles. The frame is so interlocked as to be
prevented from sagging, even if the bolts are loose,
a feature not possessed by any other swing man-
ufactured. There are two sizes manufactured, adapted
for both lawn and parlor. No. 1, or largest size,
has standards 9 feet 6 inches long, with a spread of
about 9 feet, and 5 feet in width. The frame work
is so constructed that by taking out two bolts the
standards will close up, and by taking out the bolts
of the two cross pieces the frame can be closely
folded ready for shipping. The swing can be put
up or taken down ready for packing in 10 minutes.

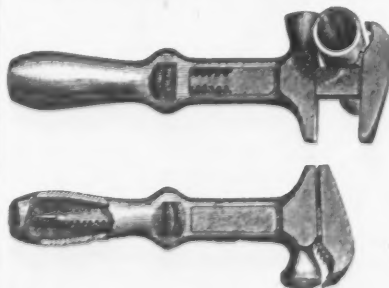
The weight of the swing is a little
less than 100 pounds. It is very
strong, having been tested by four
men whose weight aggregated over
400 pounds.

For Sale by all Leading
Dealers.

BOARDMAN'S PATENT COMBINATION WRENCH.

The Most Popular Combination
Tool in the Trade.Made in the most Thorough Manner, of the
Best Material and Finish,

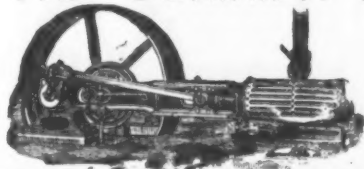
By TOWER & LYON,

95 Chambers Street,
NEW YORK.

DEAN BROS. STEAM PUMP WORKS.



THE CUMMER AUTOMATIC ENGINE



IS UNEQUALLED IN
Ease of Operation, Effective Duty, Close Regulation,
Quick Starting Up to Speed, Uniformity of
Speed and Economy of Fuel.
IT IS THE BEST ENGINE MADE.

Printed matter, cuts and information promptly furnished on application. Send for our illustrated Catalogue.

THE PROSPECT MACHINE & ENGINE CO.,
Formerly THE CUMMER ENGINE CO., Cleveland Ohio.



Issues Policies of Insurance after a careful inspection of the Boilers,
COVERING ALL LOSS OR DAMAGE TO
BOILERS, BUILDINGS and MACHINERY,
ALSO COVERING LOSS OF LIFE AND ACCIDENT TO PERSONS, ARISING FROM
STEAM BOILER EXPLOSIONS.

Full information concerning the plan of the Company's operations can be obtained at the
COMPANY'S OFFICE, HARTFORD, CONN.,
or at any agency.

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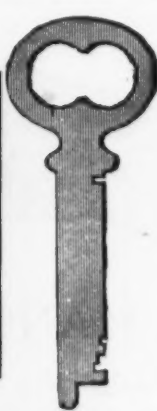
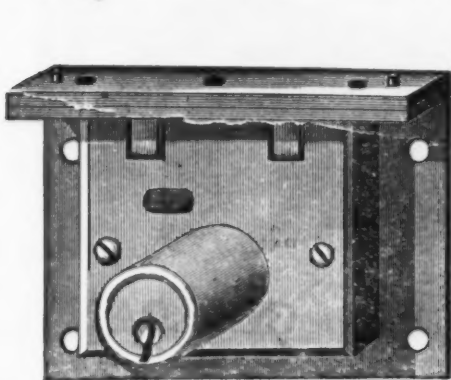
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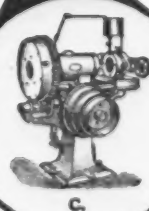
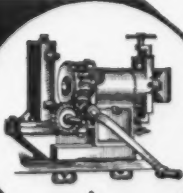
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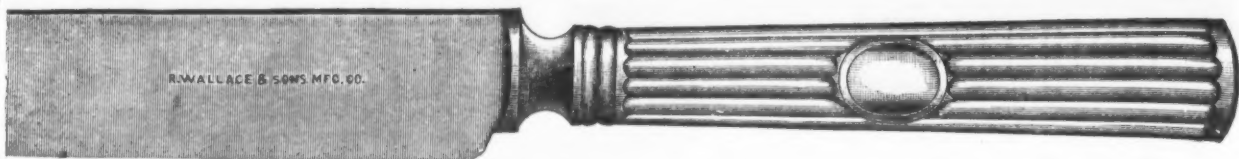
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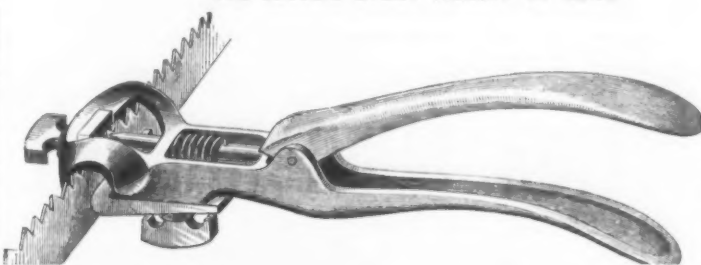
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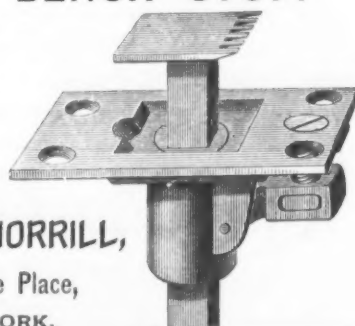
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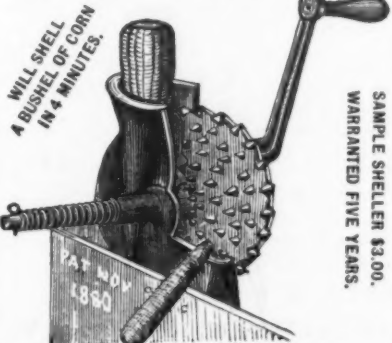


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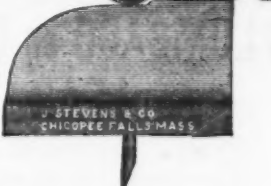
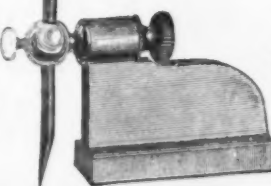
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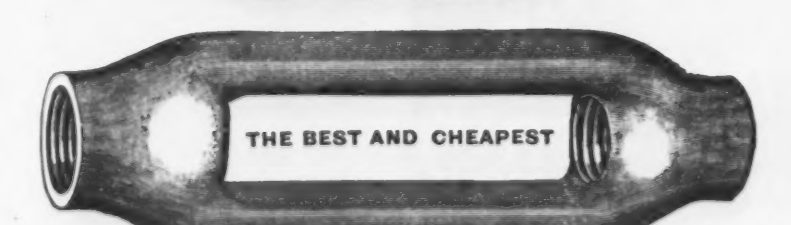
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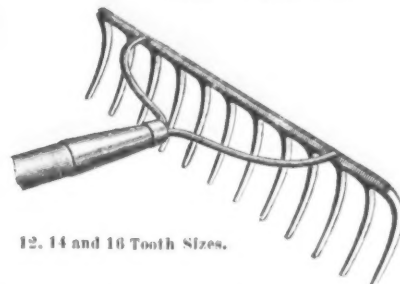
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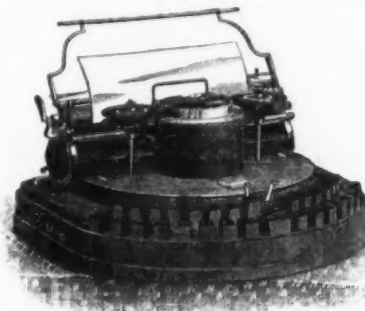
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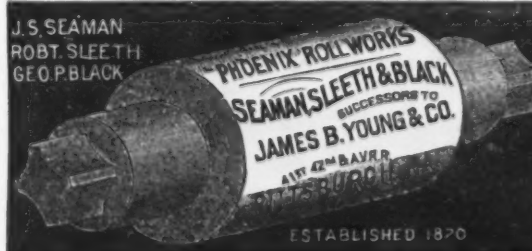
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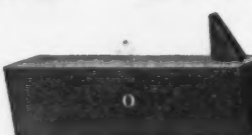
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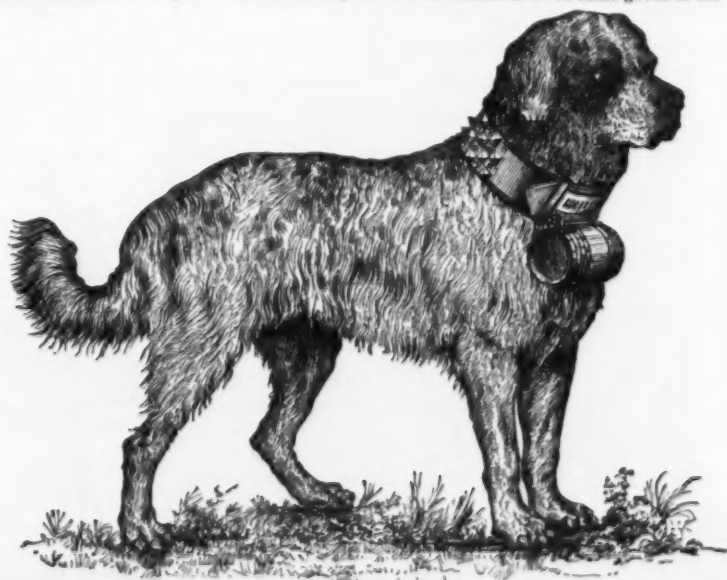
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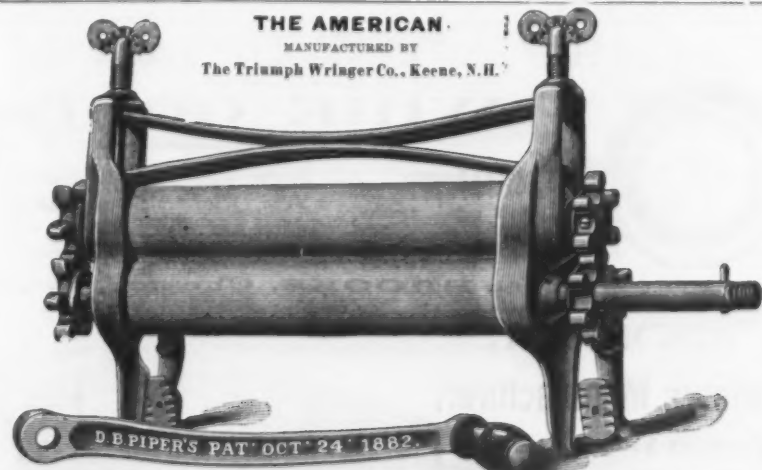


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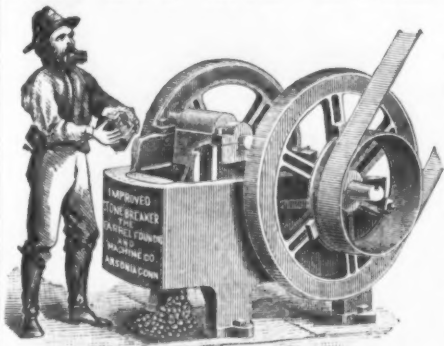
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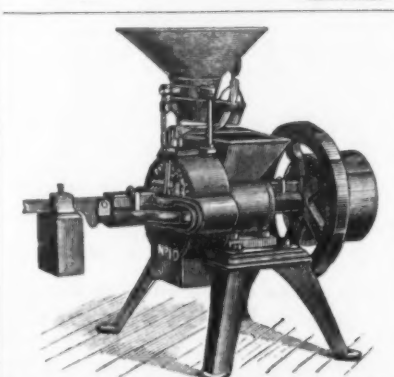
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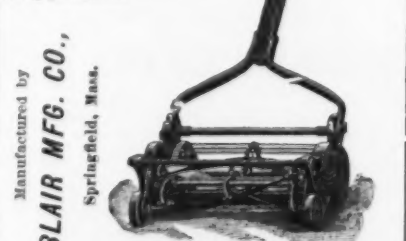
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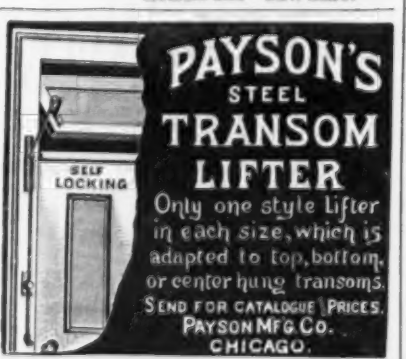
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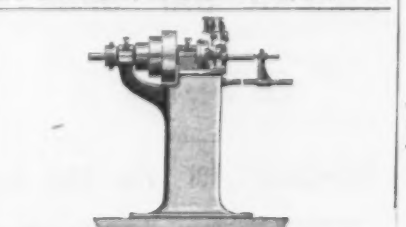


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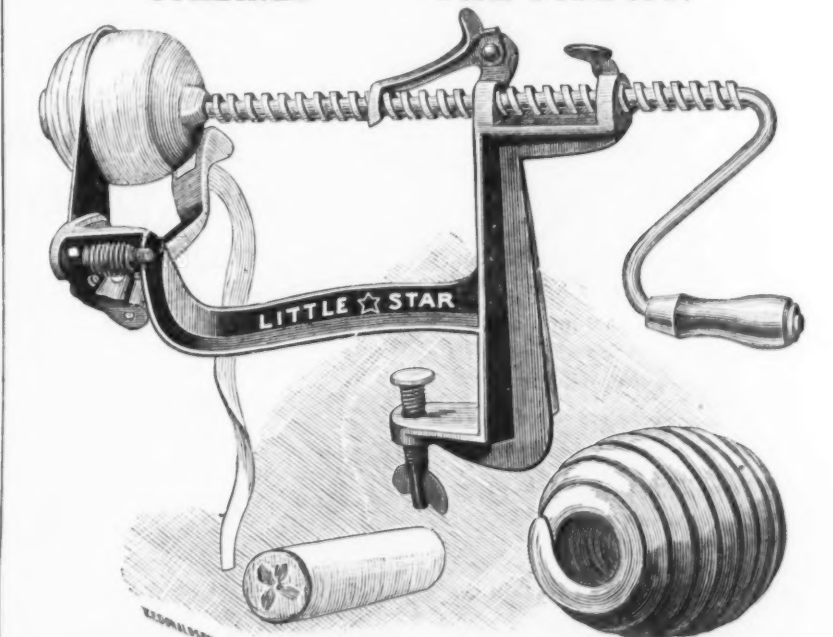
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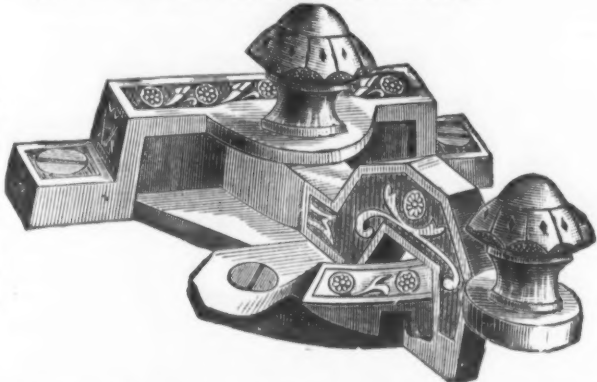
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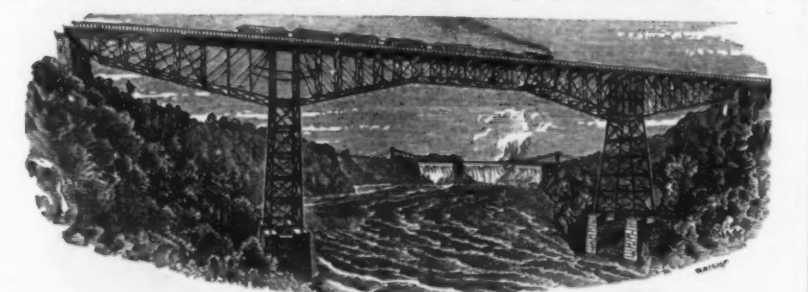
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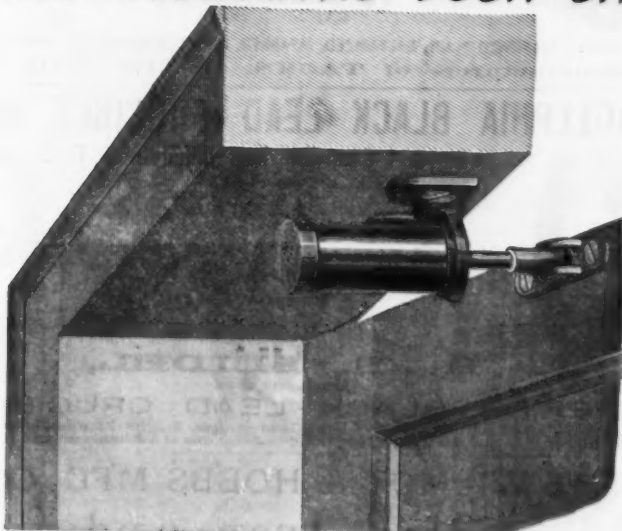
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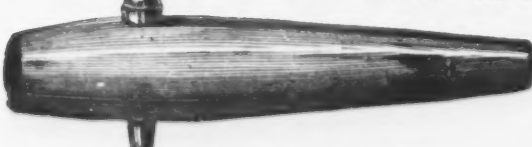
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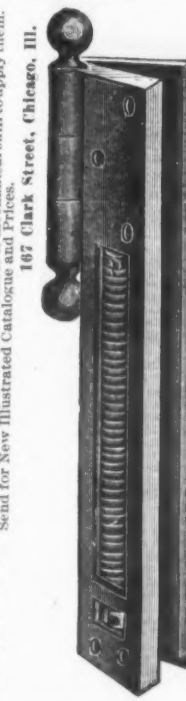
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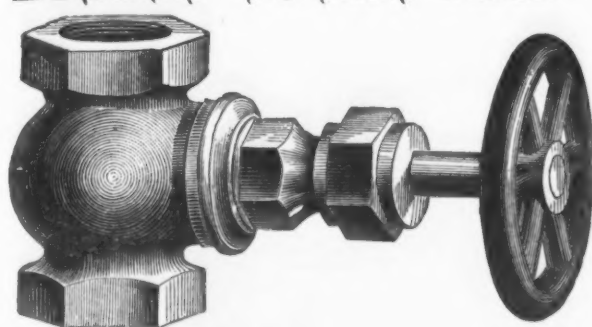
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Augers & Bits.	
L. Hommedieu's Ship Auger.....	dis 15
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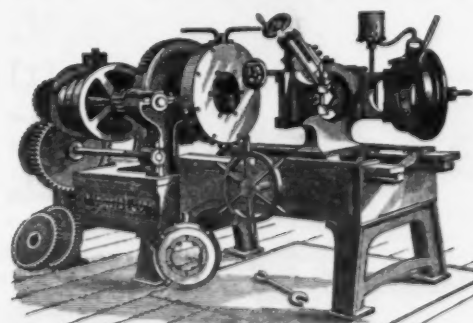
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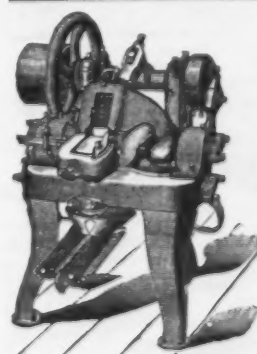
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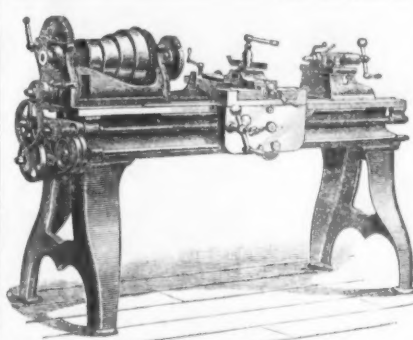
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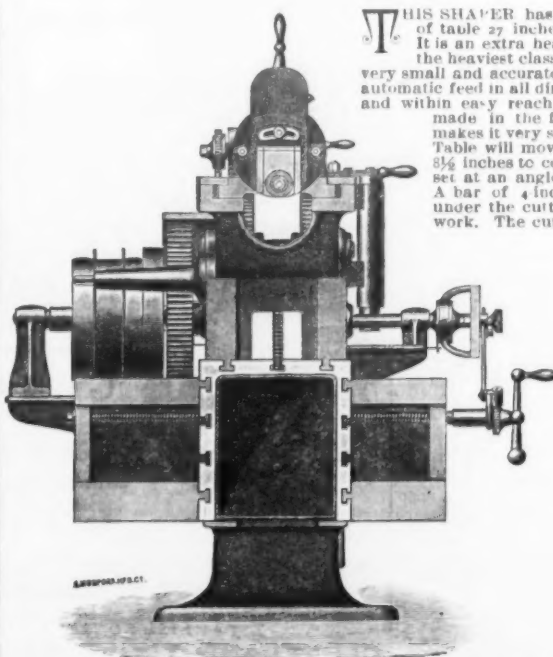


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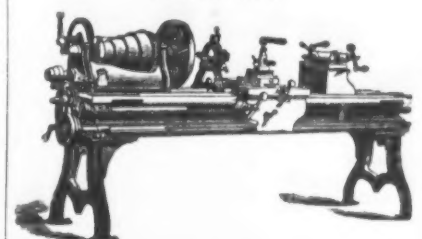
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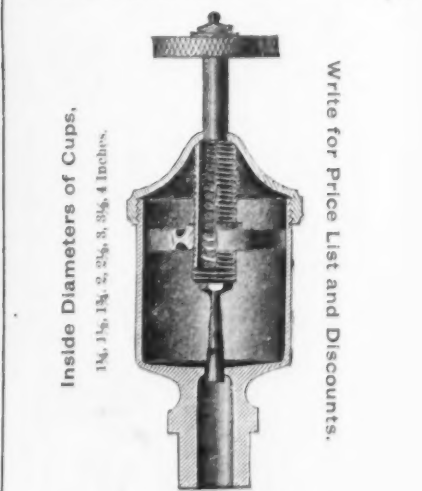
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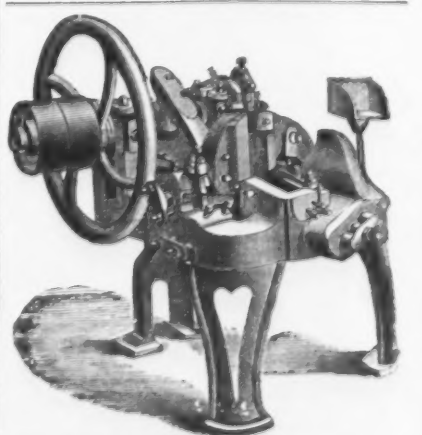
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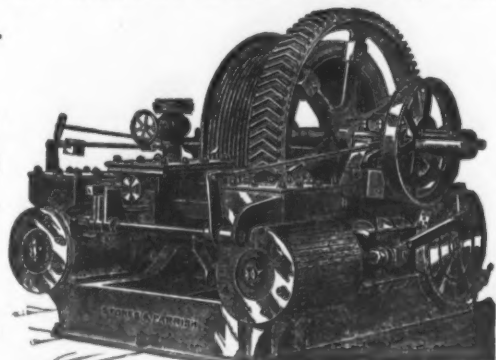
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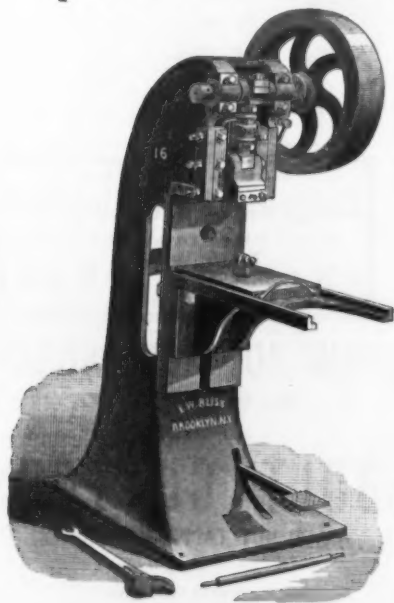
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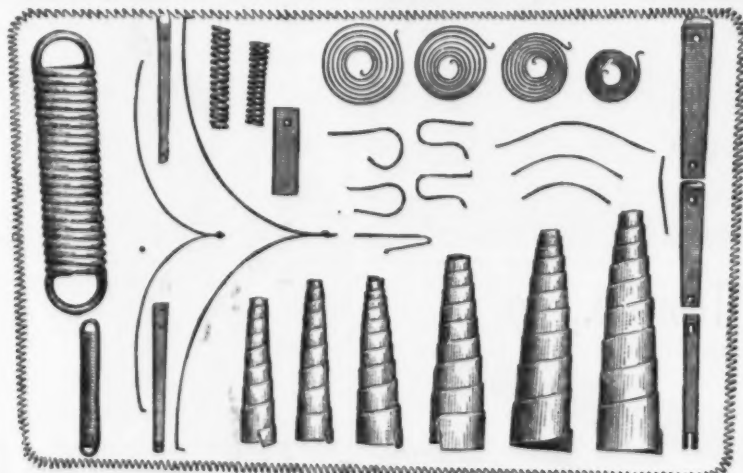
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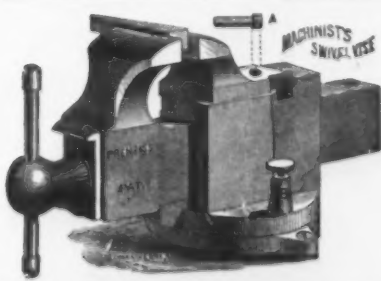
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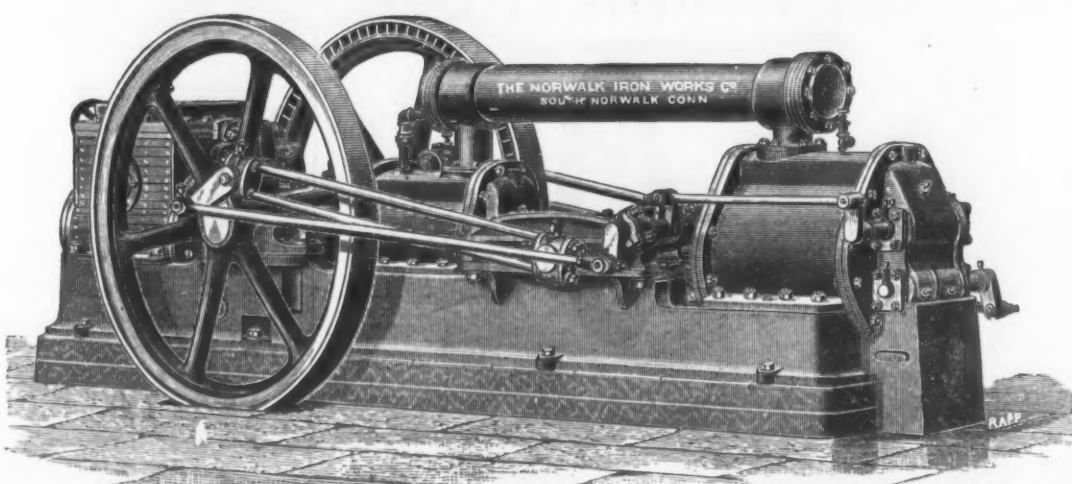
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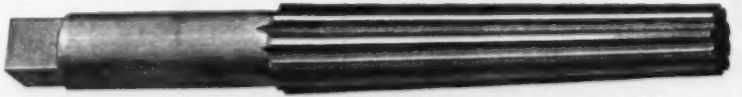
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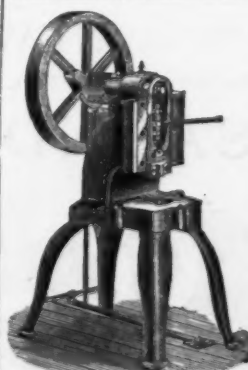


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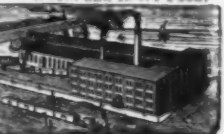
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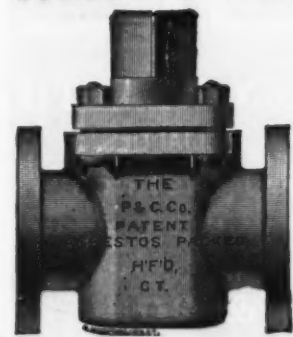
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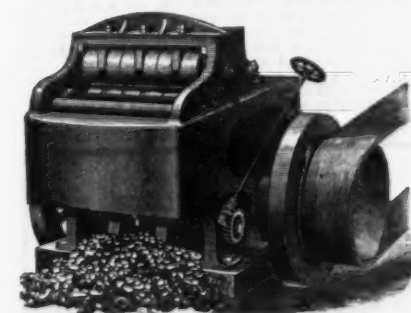
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A feature possessed by no other Crusher in the market.

Will take Larger Rock, give more Uniform Product, and more of it, than any other Crusher.

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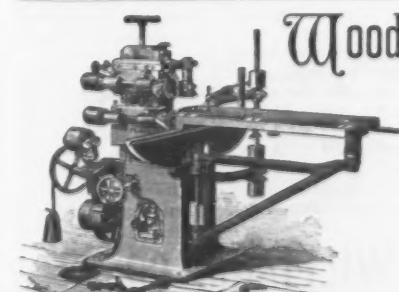
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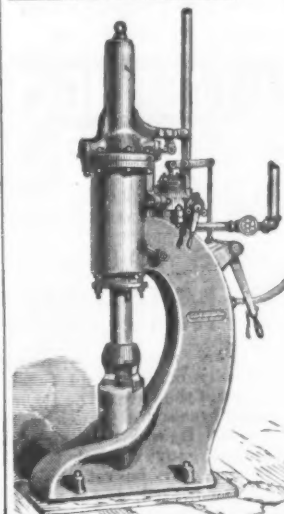
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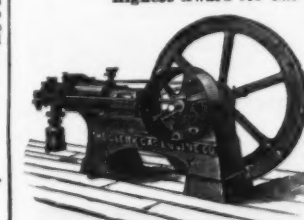
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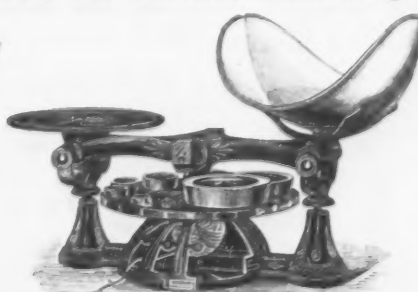


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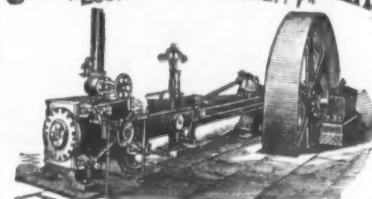
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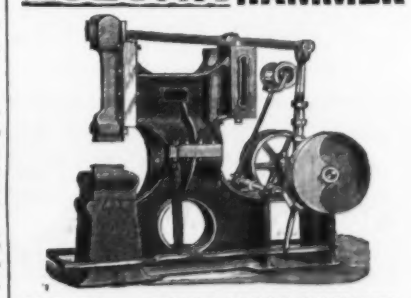
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requires no screws or

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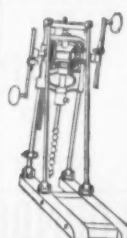
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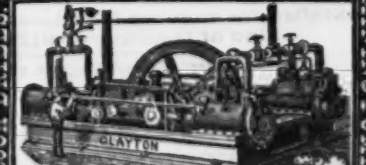
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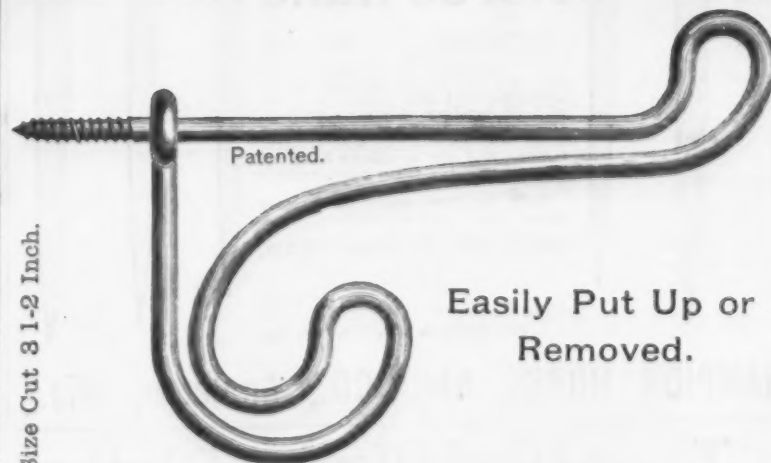
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2½ inch.....	60	2.15	160	2.00	260	2.65	760	5.20
3 inch.....	70	2.55	170	2.40	270	3.40	770	6.60
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